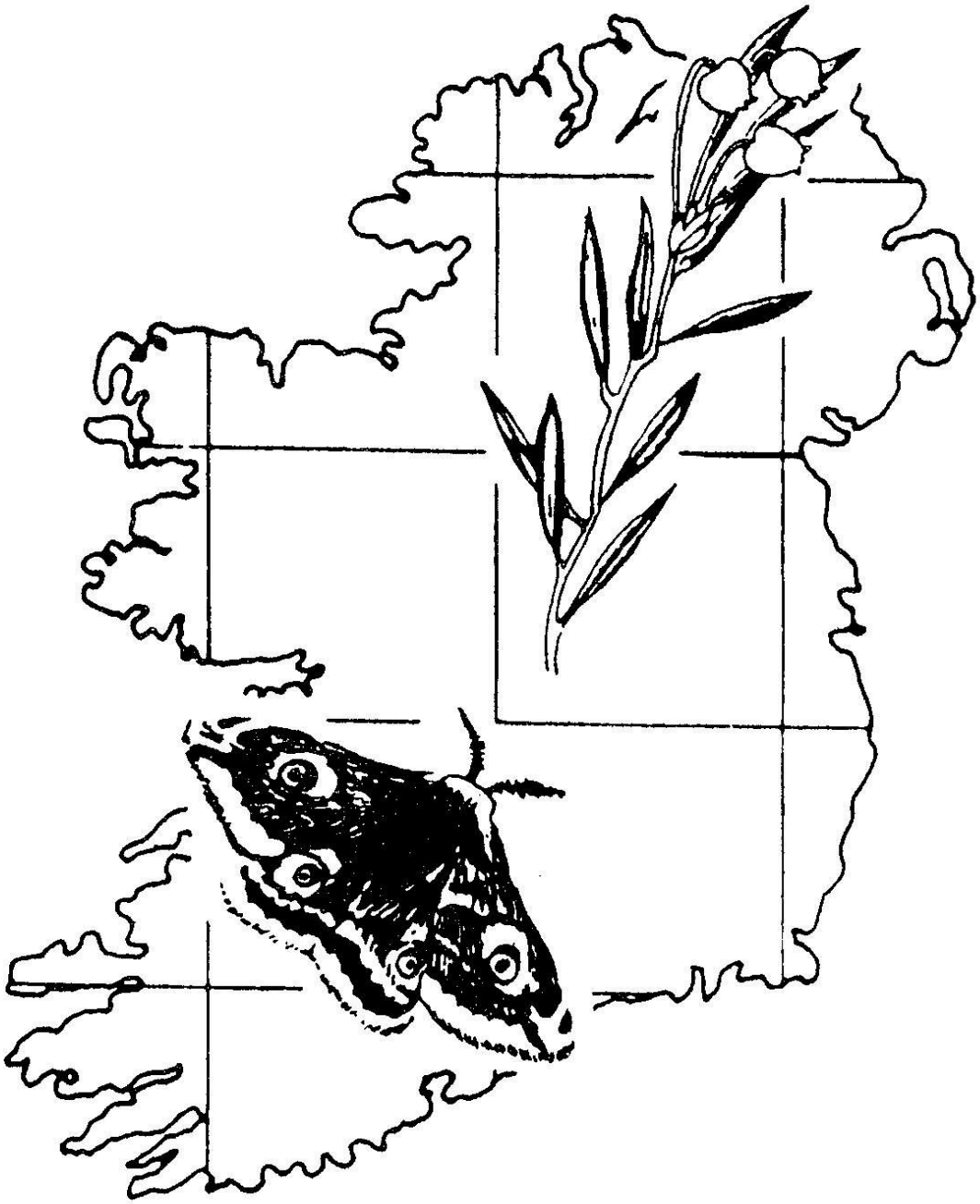
IRISH BIOGEOGRAPHICAL SOCIETY



Bulletin No. 32

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BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY

Number 32

CONTENTS

EDITORIAL

This issue contains a very interesting range of papers covering *inter alia* conservation, the arthropod biodiversity of agricultural grassland and 31 species new to Ireland. The additions to the Irish fauna are represented by seven crustaceans, two gall mites, eight spiders, two gamasid mites, a cranefly, six gall-midges, a hoverfly, an ant and three parasitoid wasps. Numerous new county records are also reported. In this context, the paper detailing 669 new spider records is of particular interest. Another article describes the fascinating 'Connogh' and 'Arglogher' of the17th-century. A short history of the Society and its officers is provided in the final paper. The Irish Biogeographical Society is very grateful to the authors for their contributions.

This year, the Society published another volume in its *Macro Series* in association with the National Museum of Ireland. Entitled *An annotated checklist of the Irish two-winged flies (Diptera)*, it was compiled by Peter Chandler, the editor and Robert Nash. The checklist records 3313 valid species. Further details are given elsewhere in this *Bulletin*.

On behalf of the Committee, I wish to thank Dr Pat Wallace, Director of the National Museum, for his support, our sponsors for their essential financial assistance and our referees for their advice. The Society is indebted to Mr Pat O'Sullivan for his very generous donation towards the publication costs of the *Bulletin*.

J. P. O'Connor

Editor

1 October 2008

INSTRUCTIONS TO CONTRIBUTORS

1. Manuscripts should follow the format of articles in this *Bulletin*. The titles of journals should be given in full in the references.

2. Manuscripts should be submitted as typed copy on A4 paper, using double-spacing and 2.5cm (one inch) margins. Whenever possible, also submit the text on diskette. **Word is preferred and Times New Roman 13pt should be used.**

3. Figures and tables should be submitted in a size suitable for reduction to A5 without loss of detail. It is important that the text should remain legible after reduction.

4. Records: please ensure that, when possible, 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. N3946), county or vice-county 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.

5. 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 or e-mailed to the Editor c/o ampersandwalsh@gmail.com.

Bull. Ir. biogeog. Soc. No. 32 (2008)

A NEW RECORD OF THE BLACKFLY *PROSIMULIUM LATIMUCRO* ENDERLEIN (DIPTERA: SIMULIIDAE) IN AN UPLAND LAKE OUTLET STREAM IN CO. LEITRIM, IRELAND

Maria Callanan, Jan-Robert Baars and Mary Kelly-Quinn
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The blackfly *Prosimulium latimucro* Enderlein (Simuliidae) is known to have a restricted distribution with a narrow ecological tolerance occurring at high altitudes in mountain streams (Bass, 1998; Jedlička, 2006). Jedlička (2006) describes *P. latimucro* as a disjunctive oreal (high altitude) and relic species and that its distribution covers the mountainous areas of Western and Central Europe and the European part of the Mediterranean.

All Irish distribution records have previously been confined to the Wicklow Mountains (Crosskey, 2004; Tierney *et al*., 2005). By targeting specific habitats, such as upland lake outlets, as suggested by Tierney *et al*. (2005), we have sought to expand the known distribution of *P. latimucro*.

The collections were made as part of a larger study of the macroinvertebrate communities of headwater streams with different source types (Callanan *et al*., in press). Samples were collected using one minute multi-habitat kick sampling in May 2005. A total of 31 sites were sampled.

P. latimucro was located in the outlet stream of Derrynananta Lake (H10095 23123), 0.7km from the lake source. The site altitude is 350m a.s.l. but the lakes highest point lies at 460m a.s.l. This represents the first record of *P. latimucro* in Co. Leitrim and the most westerly record of the species in Ireland and the British Isles. This locality is approximately 180km northwest of the previously known distribution in the Wicklow Mountains. The stream site had a steep slope dominated by riffle and pool habitats with mainly boulder, cobble and pebble substrate. It drained moorland with peaty soils and has an underlying calcareous geology. Several individuals, sixteen in total, were collected in May, although previous studies show that the

species is usually found between July and September but specimens have been found in the English Lake District in April (Bass, 1998).

From recent studies *P. latimucro* has been found to only occur at high altitudes sites in mainland Europe, generally above 1000m a.s.l. (Jedlička, 2006; Füreder, 2007; Maiolini and Lencioni, 2001). Jedlička (2006) found that the occurrence of *P. latimucro* below 900m a.s.l. was 'exceptional' and 'accidental' yet the most northerly distribution of this species is thought to be in England and Scotland where it occurs at much lower altitudes ranging from just 252-412m a.s.l. The site in Co. Leitrim fits within this range.

Interestingly, the distribution of *P. latimucro* with respect to altitude is similar to of the mayfly *Ameletus inopinatus* Eaton. *A. inopinatus* is a high-altitude species but occurs at lower altitudes in the more northerly sites in the British Isles. Baars *et al.* (2005) suggests that the restricted distribution of *A. inopinatus* is likely to be related to temperature and a similar relationship may exist for *P. latimucro.* This hypothesis obviously requires further investigation but could yield another candidate climate change indicator.

Acknowledgements

The support and help of staff and post-graduates in the Freshwater Ecology Research Group, University College Dublin, is gratefully acknowledged. We also appreciate the access to the sites afforded by the landowners.

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Bull. Ir. biogeog. Soc. No. 32 (2008)

ADDITIONS, WITH SOME CORRECTIONS, TO THE RECORDS OF THE CRANEFLIES OF IRELAND (DIPTERA: CYLINDROTOMIDAE, LIMONIIDAE, PEDICIIDAE AND TIPULIDAE)

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Abstract

Corrections and additions are made to the published lists of the craneflies (Diptera) of Ireland. *Orimarga virgo* (Zetterstedt, 1851) is recorded as new to Ireland.

Introduction

Since publication of the six parts of the craneflies of Ireland (Ashe *et al*., 1995, 1998, 2005a, b, 2007a, b), new distributional information has been discovered and these data are included here. One species, *Orimarga virgo* (Zetterstedt, 1851), is added to the Irish list. Corrections are also made to the published lists. New county records are indicated by the symbol *.

Materials and methods

The Irish national grid reference (six, four or two figure reference) is included where possible followed by the Universal Transverse Mercator (UTM) 50km grid reference in parentheses. The method used to obtain the UTM references is described in Rasmont *et al.* (1986).

List of collectors and abbreviations used for collectors' names

K. N. A. Alexander = KNAA; P. Ashe = PA; R. E. Blackith = REB; R. M. Blackith = RMB; P. J. Chandler = PJC; A. P. Foster = APF; E. G. Hancock = EGH; J. P. O'Connor = JPOC; J. P. O'Connor and M. A. O'Connor = JMOC; M. N. Smith = MNS.

FAMILY CYLINDROTOMIDAE

***Cylindrotoma distinctissima* (Meigen, 1818)**

A frequent species in woods in Britain, but more localised in Ireland (Ashe *et al*., 2005b).

ANTRIM: 19.v.1992, Collin Glen J2772 (PA.3), KNAA.

FAMILY LIMONIIDAE

SUBFAMILY CHIONEINAE

***Erioconopa diuturna* (Walker, 1848)**

Previously recorded from Counties Antrim, Clare, Roscommon and Wicklow (Ashe *et al*., 2007a).

***MEATH**: 28.x.1992, Batterjohn Big, swept in a gravel pit containing marshy areas and pools, N8953 (PV.4), JMOC.

***Gonomyia* (*Gonomyia*) *tenella* (Meigen, 1818)**

This is the first definite record from the southern half of Ireland (Ashe *et al*., 2007a). An earlier one in 1901 from Glengarriff, Co Cork is considered doubtful. The species is also known with certainty from Counties Mayo, Monaghan, Roscommon and Sligo.

***KERRY**: 5.viii.2004, Lough Gill, swept from vegetation beside the lake, Q6114 (MT.1), JPOC.

***Molophilus propinquus* (Egger, 1863)**

Previously recorded from Counties Antrim, Clare, Donegal, Kerry and Offaly.

***CARLOW**: 24.iv.1992, St Mullins S7238 (PU.2), JPOC.

CORRECTIONS TO THE SUBFAMILY CHIONEINAE IN ASHE *ET AL.* (2007A)

1. Parker (2005) should read Parker (2006) as it was was published on the 6 February 2006.

2. *Tasiocera* (*Dasymolophilus) collini* Freeman, 1951 is given in the online catalogue (Oosterbroek, 2008) as being synonymous with *Tasiocera* (*Dasymolophilus*) *halesus* (Schmid, 1949), based on the *Fauna Europaea* website. However, using the 2001 test key by Alan Stubbs, the two species seem rather different. This discrepancy needs to be resolved.

3. *Trimicra* is once again a subgenus of *Symplecta*.

4. The paper by Speight (1990) was accidentally omitted. This author recorded the following species from **OFFALY**: 8.ix.1988, All Saints Bog N0010 (NU3):- *Erioptera* (*Erioptera*) *lutea* Meigen, *E. stictica* (Meigen) (now *Symplecta* (*Psiloconopa*) *stictica*) and *Molophilus ochraceus* (Meigen). All the species were collected by R. E. and R. M. Blackith in birch woodland, invaded by pine in places and with extensive open areas dominated by bracken and tiny glades with deep moss and sedges. The collectors also identified the material.

SUBFAMILY DACTYLOLABINAE

Dactylolabis sexmaculata (Macquart, 1826)

A rare species normally associated with exposed limestone country, the larvae developing amongst damp mosses on wet rocks (Falk, 1991). Only discovered in Ireland in 1983, in the Burren, Co. Clare (Ashe *et al.*, 1991 and 2005a) and predicted by them to occur in other western limestone areas. Its subsequent discovery on the seacliffs of the Causeway Coast is a real surprise. It is a "Notable" Red Data Book species in Britain (Falk, 1991).

ANTRIM: 9.vi.1992, Plaskin Head, Causeway Coast, at water-drips on a rocky cliff face, C958454 (PB.4), KNAA; **CLARE**: 28.iv.1996, Derrynavahagh, adults running on limestone pavement, M1705 (MU.3), PA; **WICKLOW**: v-vi.1989, Upper Lough Bray (Bré), on rock face, O1315 (PU.3), REB/RMB.

SUBFAMILY LIMONIINAE

***Dicranomyia* (*Dicranomyia*) *autumnalis* (Staeger, 1840)**

A very widespread species in Ireland and Britain.

***ANTRIM**: 27.viii.1998, Ballycarry Field Pond, Ballconagan, Rathlin Island D152516 (PB.4), KNAA; 11.vi.1992, Murlough Bay D195415 (PB.4), KNAA.

***Dicranomyia* (*Dicranomyia*) *didyma* Meigen, 1804**

An uncommon species in Ireland, associated with running water.

***DERRY**: 18.vi.1992, Avish, Binevenagh Escarpment C713340 (PB.2), KNAA.

***Dicranomyia* (*Dicranomyia*) *goritiensis* (Mik, 1864)**

A rare species of wet seepages on seacliffs. Only previously known in Ireland from Counties Down, Mayo and Waterford. *D. goritiensis* is a Red Data Book species in Britain (RDB3 – Rare) (Falk, 1991).

***ANTRIM**: 6.vi.1992, Hamilton's Seat, Benbane Head C962455 (PB.4), KNAA; 9.vi.1992, Plaskin Head, Causeway Coast, numerous at water-drips on rocky cliff-face, C958454 (PB.4), KNAA; 17.vi.1992, Skernaghan Point D4303 (UF.1), APF.

***Dicranomyia* (*Dicranomyia*) *lutea* (Meigen, 1818)**

Chandler (1998) notes that *D. mitis* (Meigen) includes at least five species using the 1998 test key of Alan Stubbs of which two have been provisionally identified as *affinis* (Schummel) and *lutea* (Meigen) as interpreted by Edwards (1938). Ashe *et al*. (1998) reported that it has not yet been possible to assign some Irish *mitis* records to the correct species and were only able to report one confirmed record of *lutea,* from Co. Kerry. A widespread species in Britain.

***DERRY**: 18.vi.1992, Avish, Binevenagh Escarpment C713340 (PB.2), KNAA; ***FERMANAGH**: 2.vi.1992, Castle Coole Park H2543 (NA.4), KNAA.

***Dicranomyia* (*Dicranomyia*) *modesta* (Meigen, 1818)**

A very widespread species in Ireland.

ANTRIM: 22.vi.1992, Ballykeel, Islandmagee J484962 (UF.1), KNAA; **DOWN:** 18. viii.1998, Mid Island, Strangford Lough, J5667 (UF.2), KNAA.

***Dicranomyia* (*Dicranomyia*) *sera* (Walker, 1848)**

A localised saltmarsh specialist, usually found with *Juncus gerardii* (A. E. Stubbs, pers. comm. to KNAA). Ashe *et al.* (1998) were only aware of three Irish records, from Counties Cork, Dublin and Galway. This is therefore the first record from Northern Ireland.

***DOWN**: 18.viii.1998, Ballyurnanellan, Strangford Lough J5667 (UF.2), KNAA.

***Dicranomyia* (*Melanolimonia*) *caledonica* (Edwards, 1926)**

A scarce species of boggy ground with rushes (Falk, 1991), only known in Britain from Scotland where it is fairly widespread. Ashe *et al.* (1998) were only aware of a single Irish record, from Co. Kerry.

***ANTRIM**: 11.vi.1992, Murlough Bay D195415 (PB.4), KNAA.

***Dicranomyia* (*Melanolimonia*) *morio* (Fabricius, 1787)**

A marsh species, known from a scatter of Irish sites, but this is the first record from Northern Ireland.

***ANTRIM**: 22.vi.1992, Ballykeel, Islandmagee J484962 (UF.1), KNAA.

***Dicranomyia* (*Numantia*) *fusca* (Meigen, 1804)**

An uncommon species of damp woodlands. Ashe *et al.* (1998) report it from Counties Antrim, Galway and Wicklow.

ANTRIM: 15.vi.1992, Murlough Bay D2041 (PB.4), KNAA.

***Dicranomyia* (*Sivalimnobia*) *aquosa* (Verrall, 1886)**

A scarce species associated with waterfalls, wet rocks and seepages on cliffs (Falk, 1991). Ashe *et al*. (1998) report it from Counties Kerry and Wicklow. *D. aquosa* is a "Notable" Red Data Book species in Britain (Falk, 1991).

***ANTRIM**: 15.vi.1992, Murlough Bay D2041 (PB.4), KNAA; 20.vi.1992, Murlough Bay, from flushed red marl slopes, D193418 (PB.4), KNAA; **DOWN**: 30.vi.1992, Mourne Coast, flushed slopes with *Phragmites*, *Filipendula* and *Molinia* tussocks, J389271 (UF.2), KNAA.

***Geranomyia unicolor* (Haliday, 1833)**

An uncommon species of coastal cliffs and rocky shore-lines. Ashe *et al.* (1998) report it from Counties Cork, Donegal, Down, Dublin and Kerry.

DOWN: 29.vi.1992, Orlock Point J558838 (UF.1), KNAA.

***Helius longirostris* (Meigen, 1818)**

Associated with weedy ponds and bogs, but with notably few Irish records.

***FERMANAGH**: 28.v.1992, Reilly Wood, Crom Castle Estate H340255 (NA.4), KNAA.

***Limonia flavipes* (Fabricius, 1787)**

A widespread species in Britain but with remarkably few Irish records. Ashe *et al.* (1998) were only able to report it from Counties Kerry and Sligo.

***ANTRIM**: 11.vi.1992, Breesha Plantation, Murlough Bay, one adult collected at rest on wych elm *Ulmus glabra* leaf alongside path through mixed plantation, D193418 (PB.4), KNAA.

***Limonia nubeculosa* Meigen, 1804**

A very common species of shady woodlands across Ireland.

ANTRIM: 19.v.1992, Collin Glen J2772 (PA.3), KNAA; 22.viii.1998, Manor House Bank, Rathlin Island D145512 (PB.4), KNAA; **DOWN**: 18.viii.1998, Mid Island, Strangford Lough J5667 (UF.2), KNAA; 21.viii.1998, Reagh Island, Strangford Lough J5264 (UF.2), KNAA; ***FERMANAGH**: 1.vi.1992, Gole Wood, Crom Castle Estate H3324 (NA.4), KNAA; **LEITRIM**: 30.viii.1998, Glencar Woods G7543 (NA.2), KNAA.

***Limonia phragmitidis* (Schrank, 1781)**

A widespread species in Ireland, although with few records. Found in lowland broad-leaved woodlands on rich soils.

***ANTRIM**: 11.vi.1992, Breesha Wood, Murlough Bay D193418 (PB.4), KNAA.

***Lipsothrix remota* (Walker, 1848)**

Known from notably few Irish counties i.e. Clare, Fermanagh, Offaly and Wicklow (Ashe *et al*., 1998). Develops in wet dead wood in seepages and carr, but also in wet ground along streams.

***ANTRIM**: 15.vi.1992, Murlough Bay D2941 (PB.4), KNAA; **CLARE**: 25.v.1992, Lisdoonvarna Spa R1397 (MU.3), JMOC (previously recorded from this site on 22.v.1970 (Ashe *et al*., 1991 and 1998)); **KERRY**: 28.v.1995, Cloghereen River, Killarney, reared from wood in water, seven adults emerged between 29.v.-6.vi.1995, V9886 (MT.3), JPOC.

***Neolimonia dumetorum* Meigen, 1804**

A widespread species in Ireland. Develops in very rotten dead wood of various broadleaved trees.

WICKLOW: 17.vi.1993, Deputy's Pass, Glenealy T2390 (PU.3), KNAA; 13.vi.1993 Drumgoff Bridge, Glenmalur T1090 (PU.3), KNAA; 19.vi.1993, Powerscourt Deer Park, 01912 (PU.3), KNAA.

***Orimarga virgo* (Zetterstedt, 1851) New to Ireland**

A Red Data Book (RDB3 – Rare) species in Britain, not previously reported from Ireland, and which on British sites tend to favour base-rich seepages, often on coastal cliffs (Falk, 1991).

***ANTRIM**: 20.vi.1992, Murlough Bay, from flushed red marl slopes, D193418 (PB.4), KNAA; ***DOWN**: 30.vi.1992, Mourne Coast, flushed slopes with *Phragmites, Filipendula* and *Molinia* tussocks, J390265 (UF.2), KNAA.

***Rhipidia maculata* Meigen, 1818**

A very widespread species in Ireland.

ANTRIM: 15.vi.1992, Murlough Bay D2041 (PB.4), KNAA; **CLARE**: 18.v.1988, Caher Valley, swept from rocky grass heath, M1508 (MU.3), KNAA; **DOWN**: 21.viii.1998, Reagh Island, Strangford Lough J5264 (UF.2), KNAA; ***FERMANAGH**: 3.vi.1992, Florence Court H1734 (NA.4), KNAA;

SUBFAMILY LIMNOPHILINAE

***Austrolimnopkila ochracea* (Meigen, 1804)**

A very widespread species in Ireland, developing in all kinds of decaying wood.

***ANTRIM**: 15.vi.1992, Murlough Cottage Wood D198418 (PB.4), KNAA; 2.viii.1998, Manor House Bank, Rathlin Island D145512 (PB.4), KNAA; ***FERMANAGH**: 28.v.1992, Reilly Wood, Crom Castle Estate H340255 (NA.4), KNAA; ***LEITRIM**: 30.viii.1998, Glencar Woods G7543 (NA.2), KNAA; **WICKLOW**: 17.vi.1993, Devils Glen T2499 (PU.3), KNAA; 17.vi.1993, Deputy's Pass, Glenealy T2390 (PU.3), KNAA; 13.vi.1993, Drumgoff Bridge, Glenmalur T1090 (PU.3), KNAA; 19.vi.1993, Glen of the Downs, 02611 (PU.3), KNAA;

13.vi.1993, Glendalough Oakwoods, T1296 (PU.3), KNAA.

***Eloeophila maculata* (Meigen, 1804)**

A widespread species in Ireland.

ANTRIM: 26.viii.1998, Ballyconagan south-west wetlands, Rathlin Island D143517 (PB.4), KNAA; 27.viii.1998, Manor House Bank, Rathlin Island D145512 (PB.4), KNAA.

***Eloeophila submarmorata* (Verrall, 1887)**

Only known from a very few Irish localities in Counties Clare, Down, Fermanagh and Kerry (Ashe *et al*., 2005a).

***ANTRIM**: 11.vi.1992, Murlough Bay D195415 (PB.4), KNAA.

***Epiphragma ocellare* (Linnaeus, 1761)**

A rare species of long-established woodlands and only known from Counties Clare, Kerry, Wexford and Wicklow (Ashe *et al*., 2005a).

***MAYO**: 17.v.1988, Hill of Doon, Connemara M0249 (MV.4), KNAA; **WICKLOW**: 17.vi.1993, Devils Glen, swept in wooded gorge, T2499 (PU.3), KNAA.

***Euphylidorea lineola* (Meigen, 1804)**

Very localised in Ireland, with just one very old (1827-1831) previous record from Co. Down (Ashe *et al*., 2005a).

DOWN: 24.viii.1998, Salt Island, Strangford Lough, swept from rushy pastures with stands of yellow iris *Iris pseudacorus*, J530502 (UF.2), KNAA.

***Euphylidorea meigenii* Verrall, 1887**

An acid bog speciality and widespread in Ireland.

ANTRIM: 28.viii.1998, Aird South C9544 (PB.4), KNAA; 23.vi.1992, Cushleake Mountain, D2238 (PB.4), KNAA.

***Neolimnomyia* (*Brachylimnophila*) *adjuncta* (Walker, 1848)**

Widespread in Ireland.

***DOWN**: 24.viii.1998, Salt Island, Strangford Lough J530502 (UF.2), KNAA; 24.viii.1998, Launches Long, Strangford Lough J5350 (UF.2), KNAA; ***FERMANAGH**: 2.vi.1992, Castle Coole Park H2543 (NA.4), KNAA.

***Neolimnomyia* (*Brachylimnophila*) *nemoralis* (Meigen, 1818)**

Widespread in Ireland.

ANTRIM: 15.vi.1992, Drumnakil, Murlough Bay D192425 (PB.4), KNAA.

***Neolimnomyia* (*Neolimnomyia*) *filata* (Walker, 1856)**

A frequent species of bogs in Britain, but surprisingly scarce in Ireland. The sites detailed below are all well-wooded.

***ANTRIM**: 17.vi.1992, Graigagh Wood, Cushendun D227323 (PB.4), KNAA; ***FERMANAGH**: 28.v.1992, Reilly Wood, Crom Castle Estate H340255 (NA.4), KNAA; 3.vi.1992, Florence Court H1734 (NA.4), KNAA; ***LAOIS**: 16.vi.1993, Abbeyleix, boggy field, S4082 (PU.1), KNAA.

***Phylidorea* (*Paraphylidorea*) *fulvonervosa* (Schummel, 1829)**

A widespread species in Ireland.

***FERMANAGH**: 28.v.1992, Reilly Wood, Crom Castle Estate H340255 (NA.4), KNAA; 3.vi.1992, Florence Court H1734 (NA.4), KNAA; **MAYO**: 30.v.1994, Old Head L8383 (MV.1), KNAA; **WICKLOW**: 17.vi.1993, Deputy's Pass, Glenealy T2390 (PU.3), KNAA.

***Phylidorea* (*Phylidorea*) *ferruginea* (Meigen, 1818)**

A widespread species in Ireland.

***ANTRIM**: 11.vi.1992, Murlough Bay D195415 (PB.4), KNAA; 28.viii.1998, Loughattachuile, Ballyconagan Townland, Rathlin Island D143524 (PB.4), KNAA; **DOWN**: 21.viii.1998, Ann's Point, Strangford Lough J5568 (UF.2), KNAA.

***Pilaria discicollis* (Meigen, 1818)**

A widespread species of ponds and marshes in Ireland.

ANTRIM: 22.vi.1992, Ballykeel, Islandmagee J484962 (UF.2), KNAA; ***FERMANAGH**: 1.vi.1992, Gole Wood, Crom Castle Estate H3324 (NA.4), KNAA.

***Pseudolimnophila lucorum* (Meigen, 1818)**

A frequent species in Britain but Ashe *et al.* (2005a) were only able to report it from three counties in Ireland *viz.* Clare, Galway and Kerry.

***DERRY**: 9.vi.1992, Downhill, adults were swept from *Juncus articulatus* and *Eleocharis* in

silted pond on cliff tops, C755359 (PB.2), KNAA.

FAMILY PEDICIIDAE

***Dicranota* (*Paradicranota*) *pavida* (Haliday, 1833)**

Ashe *et al*. (1995) were only able to report one old record from Northern Ireland, from Co. Down. An uncommon species scattered throughout the south.

***ANTRIM**: 15.vi.1992, Murlough Bay, D2041 (PB.4), KNAA.

***Pedicia* (*Crunobia*) *littoralis* (Meigen, 1804)**

A widespread species in Ireland.

***WEXFORD**: 27.v.1987, Killoughrim Forest S8941 (PU.4), swept in a mixed wood, JPOC; 7.vi.1986, Oaklands S7125 (PU.2), swept in a mixed wood, JMOC.

***Tricyphona immaculata* (Meigen, 1804)**

A very widespread species in Ireland and Britain.

ANTRIM: 8.vi.1992, Giant's Causeway, C9444 (PB.4), KNAA; 28.viii.1998, Aird South, C9544 (PB.4), KNAA; 27.viii.1998, Ballyconagan eastern rises, Rathlin Island D152518 (PB.4), KNAA; 27.viii.1998, Upper Portnacooly Pond, Rathlin Island D145522 (PB.4), KNAA; 27.viii.1998, Manor House Bank, Rathlin Island D145512 (PB.4), KNAA; l9.v.1992, Collin Glen, J2772 (PA.3), KNAA; **KERRY**: 5.ix.1998, Uragh Wood, V830630 (MT.4), KNAA; ***LEITRIM**: 30.viii.1998, Arroo Lough, Dartry Mountains, blanket bog, G837505 (NA.2), KNAA.

FAMILY TIPULIDAE

SUBFAMILY TIPULINAE

***Nephrotoma scurra* (Meigen, 1818)**

Previously known from Counties Carlow and Down.

***KERRY**: 5.viii.2004, Lough Gill, swept from vegetation beside the lake, Q6114 (MT.1), JPOC.

***Nephrotoma submaculosa* Edwards, 1928**

Previously known from Counties Carlow, Clare, Donegal, Mayo, Wexford and Wicklow.

WEXFORD: 11.vi.1982, Ballyteige, sand-dunes, S9605 (PT.3), JPOC.

***Tipula* (*Pterelachisus*) *pseudovariipennis* Czizek, 1912**

Previously known from Co. Leitrim.

***WEXFORD**: 19.iv.1992, Coolbawn S8337 (PU.4), JPOC.

***Tipula* (*Savtshenkia*) *obsoleta* Meigen, 1818**

Previously known from Counties Carlow, Dublin and Wicklow.

MEATH: 1.x.1992, River Boyne, Navan, collected in a Heath portable light trap, N8767 (PU.4), JPOC.

***Tipula* (*Savtshenkia*) *signata* Staeger, 1840**

Previously known from Counties Galway, Mayo, Roscommon and Sligo.

***CAVAN**: 8.x.1992, Virginia, on vegetation beside the lake, N5987 (PV.1), JPOC.

CORRECTIONS AND ADDITIONS TO THE FAMILY TIPULIDAE IN ASHE *ET AL.* (2007B)

1. Under *Nephrotoma crocata* (Linnaeus), the following record of Smith (2004) was accidentally omitted:- **CLARE**: 25.v.2003, Lough Graney, a female taken flying along a narrow strip of sparsely vegetated sandy ground at the northen end of the lake, R559949 (NU.1), MNS (Smith, 2004). The species is also known from Counties Down, Kerry, Laois and Wicklow.

2. On p. 299, the reference (Grimshaw, 1908) for *Tanyptera atrata* should read as (Carpenter, 1908).

3. Only two of the three records of *Tipula* (*Platytipula*) *luteipennis* Meigen given in Oosterbroek (2001) were included in the distribution in Ashe *et al*. (2007b) and citation of the paper was accidentally omitted. The record included as "**MAYO**: 25-27.ix.1974, Cross, 4km east of Cong, M. Dirks" should read **GALWAY**: 25-27.ix.1974, Maam Cross, 12km west of Cong (MV.4), M. Dirks. The missing record has the exact same data except that the collector is

P. Oosterbroek.

4. The paper by Speight (1990) was accidentally omitted. This author recorded the following species from **OFFALY**: 8.ix.1988, All Saints Bog N0010 (NU3):- *Dictenidia bimaculata* (Linnaeus), *Tipula* (*Savtshenkia*) *confusa* van der Wulp (as *Tipula marmorata* Meigen), *Tipula* (*Savtshenkia*) *obsoleta* Meigen, *Tipula* (*Tipula*) *oleracea* Linnaeus, *Tipula* (*Tipula*) *paludosa* Meigen and *Tipula* (*Yamatotipula*) *pruinosa* Wiedemann. All the species were collected by R. E. and R. M. Blackith in birch woodland, invaded by pine in places and with extensive open areas dominated by bracken and tiny glades with deep moss and sedges. The collectors also identified the material.

5. Alexander (2008) reports *Dictenidia bimaculata* from **ANTRIM**: 20.v.2006, 13.vi.2006, The Great Deer Park, Glenarm, in oak *Quercus* (reared from larvae and pupae, adults hatched 28.vii.2006), D2911 (UF.1), KNAA; **TYRONE**: 16.v.2006, 15.vi.2006, Baronscourt Park, in beech *Fagus* and oak (reared from larvae and pupae, adults hatched 25.vii.2006), H3682 (PA.1), KNAA; **WICKLOW**: 13.vi.1993, Glenmalur, reared from pupa in decaying oak in a mature oak woodland, T1090 (PU.3), KNAA. The species was not previously known from Counties Antrim and Tyrone.

6. Papers by Blackshaw (1983a, b; 1984; 1985) were omitted. These deal with the agricultural problems of tipulids and leatherjackets in Northern Ireland. Only one (Bradshaw, 1983a) gives localities. While *T. oleracea* and *T. paludosa* were both taken, only the latter is definitely recorded from Newforge Lane Belfast, the Agricultural Research Institute, Hillsborough, Co. Down and Greenmount Agricultural College, Co. Antrim.

Acknowledgements

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NOTES ON THE 2007 BREEDING SEASON OF THE NATTERJACK TOAD *EPIDALEA CALAMITA* LAURENTI (ANURA: BUFONIDAE) IN IRELAND

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Abstract

Field observations of May 2007 at native and translocated natterjack toad (*Epidalea calamita*) breedings sites in Counties Kerry and Wexford are recorded. Relative numbers of toad and common frog (*Rana temporaria*) tadpoles are noted along with habitat quality status and future sustainability. Factors causing population decline and possible remediation are discussed. Recent references on the toad in Ireland are included.

Achomaireacht

Cláraítear san alt seo breathnadóireacht allamuigh a rinneadh i Mí na Bealtaine 2007 ag láithreáin síolraithe dúchasacha agus trasghluaisithe an chnádáin (*Epidalea calamita*) i gContaetha Chiarraí agus Loch Garman. Cuirtear líon coibhneasta torbán na gcnádán agus torbán na bhfrog (*Rana temporaria*) in iúl, chomh maith le stádas chaighdeán na gnáthóige agus a hinbhuanaitheacht sa todhchaí. Pléitear na tosca a chuireann le meath a lín agus féidearthachtaí leasúcháin. Cuirtear tagairtí úrnua ar an chnádán in Éirinn ar fáil.

Introduction

The natterjack toad, *Epidalea calamita* Laurenti, 1768 (formerly *Bufo calamita*), is one of three amphibian species native to Ireland. Frost *et al*. (2006) published the change in the generic name by resurrecting *Epidalea* from the synonomy of the species to reflect sufficient differences in molecular data that distinguish the natterjack from other Eurasian bufonids.

Historical references to the presence of adults and their distribution in Ireland were

summarized by Korky and Webb (1999), larval morphology examined by Korky and Webb (2001). Beebee and Rowe (2000) used molecular methods to make a preliminary examination of the species European provenance based in part on five larval samples obtained in Co. Kerry from "around Dingle Bay and Castlegregory". Beebee (2002) then reported on the status and conservation requirements of Irish habitats for both native and translocated populations in Counties Kerry and Wexford respectively. Most recently, Rowe *et al.* (2006) made a more definitive examination of the toad's probable provenance and dispersal across its entire biogeographical range from Ireland to western Russia using both mitochondrial DNA and nuclear microsatellite DNA data. This study relied on previous data from Kerry sites used by Beebee and Rowe (2000). Shaw (2006) then reported on the conservation of Kerry breeding sites. Lastly, Bécart *et al*. (2007) developed monitoring protocols used at eleven Kerry sites for 2004-2006 to statistically analyze population growth dynamics and make conservation recommendations for each mapped site.

The purpose of this study is to: (1) document where successful breeding was observed in Irish native and translocated populations during the 2007 breeding season; (2) comment on habitat quality and the likelihood of a given habitat remaining viable in the long term and (3) provide samples for further studies.

Methods

All field observations were made by the author in May 2007, an active time of breeding following winter hibernation and spring emergence. Toad tadpoles are easily distinguished from the common frog, *Rana temporaria* Linnaeus, 1758, by their smaller size, rarely >25mm, and jet black colour while the frog's are larger and olive coloured. Locality names follow Beebee (2002) which also includes maps, appendices 1 and 2. Sample collections were made under license granted by the National Parks and Wildlife Service (NPWS), as the species is protected by both Irish and EEC regulations. Irish grid references are provided.

Results

Co. Kerry extant native populations

Fermoyle (Q550122). Decades of repeated marine incursions along the sea wall and inward on low-lying fields and drainage schemes have made this westerly population on the northern Dingle Peninsula nonviable. The last few spawn and toadlets were observed there in 2004 in a pond at the eastern end of the sea wall (Bécart *et al*., 2007). Additional ponds above sea inundations were proposed for the Drom Dunes west of Fermoyle where spawn and tadpoles could be reintroduced (Beebee, 2002). I have no observations to place natterjacks presently at this site.

Castlegregory Golf Club at Stradbally (Q592137). Located at the western end of Lough Gill, the course was created among coastal dunes in the period 1989-1991. Its water hazards near the ninth hole are testaments to how human development and natterjack survival can be mutually complimentary. The artificial ponds annually have hundreds of spawn strings and thousands of tadpoles, some of which have been previously used for translocations. I observed a myriad of them in both ponds as well as isolated common frog tadpoles. Adult toads were seen emerging from surrounding dunes in late evening, while smaller ones could be found in the dunes during daytime. Smaller aquatic habitats lie to the east of the above ponds, but have steep banks and large amounts of vegetation making them ancillary at best for breeding. Net sweeps of these areas did not turn up spawn or tadpoles. This is a premier breeding site free of road traffic and most anthropogenic pollutants, and serves as a habitat model for sustainability.

Lough Gill (Q606142). The Lough is about 150ha and both tadpoles and adults have been reported there for decades, particularly along the northeastern shore shallows among reeds. I proceeded in these shallows for 100m north of the pier but did not observe any type of natterjacks. However, since the shoreline is so extensive they might well have been present in the next 100m or somewhat offshore particularly just south of the Magherabeg slacks. Bécart *et al.* (2007) did note spawn strings along the northeast shore in each of the three years of their study confirming this likelihood. The Lough is a viable habitat that is permanent due to its size and is part of the metapopulation complex of the region. Further field study is warranted to

determine its productivity.

Magherabeg Slacks (Q606152). Beebee (2002) reported *circa* 25 slack ponds may form here. No more than nine formed during the three year study by Bécart *et al.* (2007: p.67), who suggested reasons for a declining water table. All are rainfall dependent and most are ephemeral, putting spawn and tadpole survival at risk. I found smaller slacks dry with crusty bottoms as rain was scarce at the time of visit. A few of the larger ones did contain water and spawn strings and tadpoles. A particularly large slack of *circa* 20 x 20m with 1m depth , #25 on the map in Beebee (2002), north of farm outbuildings, had thousands of toad tadpoles plus some of the common frog. The size and depth of this slack suggests it could be quasipermanent. This larger slack and similar ones are potentially viable breeding sites where beneficial cattle grazing may offset their water consumption and human encroachment is minimal.

Lough Naparka (Q623170). This is historically a virtual permanent slack of the Magherabeg complex, #1 on the map in Beebee (2002), lying just west of Tralee Bay. I had collected tadpoles there in 1997 and visited it several times since when hundreds of tadpoles were annually observed. On this occasion however it was *circa* 80% dry owing to the paucity of rainfall. No spawn or tadpoles were present in the remaining marshy areas, nor could adults be turned up in surrounding dunes or stone fence lines. Within the considerable precipitation variability, the Lough potentially remains a viable breeding habitat somewhat protected from humans by its remoteness. However, a 28 May 2008 visit indicated breeding conditions had further deteriorated from 2007 as 90% of the basin was mud with flourishing irises, only three areas of vegetation choked water of <10mm were devoid of any spawn or tadpoles, and the entire area and basin were heavily cut up by cattle hooves making survival of any breeding adults or tadpoles unlikely had they been there. It appears this site is presently not viable for breeding, and since all the near slacks numbered 2- 12 in Beebee (2002) were dry also, it is highly questionable as to how far north on the peninsula breeding is sustaining the historic population.

Tullaree (Q636124). This site represents the eastern appendage of the northern Dingle Peninsula metapopulation. Toads were found there in 1983, and two scrape ponds were

deepened in 1999 by the NPWS. A total of five mechanically excavated ponds on bog and heath now exist there inward of old farm buildings near the road. Four of the five ponds contained thousands of tadpoles. The fifth was devoid of even one tadpole for reasons unknown. The site is overall viable as the ground is not suitable for farming and has a wire fence protecting it from the roadside while permitting grazing inside.

Roscullen Island (Q760024). This relictual population site is *circa* 50ha of wet meadows south of the Castlemaine-Inch road. No grazing animals were present at the time of observation, and drainage ditches abounded. No toad stages were present in them. Isolated toad and common frog tadpoles were seen at the point indicated on the map of Beebee (2002) as "marsh pool". This is a large wet area deserving naming indicative of more than a pool, and could support more breeding than that observed. Shaw (2006) reported new ponds were created to facilitate breeding. I observed two just north of the seawall undergoing reinforcement. One scrape pond contained hundreds of toad tadpoles, the adjacent pond appearing identical, strangely none. This entire site is a separate expanding population. Bécart *et al*. (2007) note that it is disjunct from any others, but given its relative isolation and quality is viable and represents a vestige of the once widespread occurrence of the toad dating back two centuries along Castlemaine Harbour.

Inch Peninsula (V656998). The site consists of *circa* 400ha of dune peninsula with mixed salt and fresh water marshes along its eastern shore. Much of it is used as a grazing commonage, and it could support a flourishing toad population. Development as a golf course has been proposed for years, and I did observe local signage stating "No Inch Golf, No Votes". As in previous visits (Korky and Webb, 1999), I could find no trace of any natterjacks, although spawn strings were reported by Beebee (2002) as recently as that year in the marshy areas. The peninsula suffers from a lack of freshwater pools due to varying precipitation, drainage of the marshes, and repeated sea incursions. I was not able to find any slacks among the dunes during any of my surveys, making fresh water the major limiting factor for breeding. Vehicles driving on the strand at the north end have proven a problem for the County Council to limit, and unfortunately as the *Irish Examiner* reported on 5 June 2008, dunes at Inch and Magherabeg are suffering from illegal camping and the ravages of "boy racers" using quad bikes. An area of

great toad potential, the fate of Inch has yet to be determined.

Lough Yaganavan (V705955). Likely the premier breeding site on the Iveragh Peninsula because of its permanence and size of *circa* 60ha, its north shore is accessible from the perimeter Lake Road. Abundant tadpoles collectively in thousands were observed along the northeastern shoreline shallows, and toadlets could be occasionally turned up under rocks along the shore. Although residences have been built along the north shore, some newer on the peninsula down towards the water, the overall border is rough and hopefully will remain undeveloped. Consequently, the surrounding terrestrial habitat likely supports thousands of adults that make their way to the Lough in the breeding season at nightfall. Free of sea incursions this site should be viable for the long term, and deserves to be surveyed along its entire shoreline which has not been done to date.

Lough Nambrackdarrig (V702939). This site is the farthest inland toad locality from the sea in Ireland, *circa* 2.4km, freeing it of sea incursion and is likely part of a metapopulation with Lough Yaganavan. It is surrounded by rough bog and pasture, and adult population and egg to toadlet survival estimates are low (Bécart *et al*., 2007). I observed hundreds of swarming tadpoles at the north shore water's edge in spite of the land's abrupt dropoff, deepening water offshore, and overgrown vegetation down the descent to the Lough from the road above. Some newer homes have been built above this north shore but the overall perimeter is free of development. This site is an adjunct to Lough Yaganavan, but habitat improvement could increase its toad productivity from marginal to enhanced.

Dooaghs Golf Links (V680944). I had collected tadpoles here before and was not disappointed this time, although abundance was lower than I expected. The largest pond nearest the clubhouse had sufficient water but no tadpoles. Bécart *et al*. (2007) commented on its eutrophication, predator presence, and probable anoxic conditions. These unfavourable parameters could be corrected to make it toad productive without interfering with the course's recreational value. The next pond farther from the club had hundreds of tadpoles but was half dry, suggesting deepening might be desirable. Lastly, the third farthest pond had considerable water but only scarce tadpoles. Adjacent wet areas are ancillary to the main ponds but could be

cleared of vegetation and enlarged to enhance habitat connectivity and recruitment. Given the club as a recipient of an European Union Environment award previously for developing toad breeding habitat, and its use of a toad as its club symbol, I would anticipate it favourably considering these suggestions.

Dooaghs Commons (V695944). Owned by the golf club, the area on the grazing commonage is large, shallow and soft mud bottomed. Although in a previous visit (1999), I found no egg strings or tadpoles, Bécart *et al*. (2007) found large amounts of both present. I did not visit the commonage on this occasion owing to the scarce rainfall at the time making breeding unlikely.

Glenbeigh Environs (V671916). Essentially a peninsula in Rossbeigh Creek, three areas of toad activity are known historically:- (1) A marshy area on the northwest coast that has suffered continuing marine encroachment and recent episodes of vehicle driving on the adjacent strand appeared to be lost. Both Shaw (2006) and Bécart *et al*. (2007) however report some adults and toadlets present in the vicinity of the repaired sluice indicating local extinction has not occurred although survival is tenuous. I did not survey this area; (2) A shallow pool exists on the grazed commonage above the creek near Reennanallagane. Reduced rainfall had rendered this area a marsh with very little free standing water at my visit. No spawn or tadpoles were present, as breeding could not be reasonably expected in those conditions; (3) A low-lying disused Quirk's quarry is present on the peninsula's eastern flank. It is heavily overgrown with vegetation, but sufficient water in adjacent, shallow, sandy bottomed, pools supported hundreds of tadpoles. The quarry unfortunately has been used as an illegal dump for construction and household debris posing an immediate threat to the breeding site if a vehicle were to drive through a pool or deposit a load onto same. These pools are very shallow and thus prone to dessication before toadlets can emerge. Glenbeigh as a whole is quite threatened with local extinction as it stands.

Co. Kerry translocated populations

Caherdaniel (V5559). This site represents an extant population on the south of the Iveragh peninsula that was fostered by translocating spawn in 1991 to reintroduce toads to a place they were historically present at. It consists of a dune complex projecting south from State owned Derrynane House. Presently, three scrape ponds are present to provide freshwater breeding sites

which seem to be the limiting factor for a thriving toad population. Two of the ponds appear older and sit below dunes free of scrub, have sloping margins, and had hundreds of toad tadpoles and a few common frog ones among submerged vegetation (Fig. 1). A newer pond dug in 2006, like the other two in many respects, had no submerged vegetation and not a single tadpole nor any other life visible (Fig. 2). Since tadpoles are herbivorous grazers the lack of plants for foraging might explain their absence, but why there is no vegetation is not apparent. This population has been considered self-sustaining for sometime and could be enhanced by adding more ponds over the large dune area.

Co. Wexford extant translocated populations

Raven Nature Reserve (T112250). This State owed property of *circa* 250ha is an afforested, duned peninsula jutting south from Curracloe into Wexford Harbour. It is *circa* 300km from the historic range of natterjacks in Kerry. Spawn from Stradbally was initially translocated in 1990 but did not survive. Multiple translocations have been repeated to as recently as 2000 (Beebee, 2000). Further monitoring will be required to verify that the population is self sustaining. Over a dozen artificial ponds are present but at least half are unsuitable for toads because of deep depth, steep bank slope, dense submerged vegetation, and surrounding heavy forest. I checked those like this along the north south main walk road from Curracloe because if toads atypically breed in Loughs in Ireland with adverse conditions compared to the ideal, one never knows if they might not be present here. They, however, were not. I checked other dubious quality ponds in the forest with the same result. My first sight of tadpoles was in a dune pond just left of the walk's southern end. This open area scrape pond does not appear on the map of Beebee (2002, Appendix 2), and is presumed newer. It had thousands of tadpoles and a few common frog ones. Next ponds 1-3 on the map had water but no tadpoles. Five ponds clustered as area 4-7 on the map were in a clearance designated by sign as "experimental grazing". All had water, were in close proximity, had sloping margins, were not encumbered by vegetation, but just two had toad tadpoles by the high hundreds. Pond 10 is quite north from others and is in open dunes located far above the strand that lies below. It too had tadpoles in the high hundreds.

Discussion

April and May 2007 saw above average temperatures and below average precipitation that may have been a factor in some breeding habitats being dry. The latter part of May and into the Autumn saw above average rainfall and breeding might have taken place after observations were made, as it has been suggested that Irish natterjacks have an extended breeding season and larval period to exploit permanent Loughs, an occurrence not seen in Britain (Beebee, 2002). It remains enigmatic as to why some sites where breeding was recorded in seemingly identical, adjacent ponds had teeming tadpoles in some and not a single tadpole in others. Recent pond alteration could explain this. Clearly, the limiting factor for successful breeding in the historic, contracted Kerry localities is suitable interconnected, freshwater sites, most commonly ephemeral ponds. Drainage projects, marine incursions, aquatic insect predation, fungal chytridiomycosis, precipitation fluctuations, eutrophication, acid rain, increased ultraviolet exposure, inbreeding, and synergistic effects of all factors have resulted in local extinctions. The logical strategy to reverse this trend involves pond development that fortunately is not overly elaborate as say a fish ladder for upstream salmon migration past a weir. Scrape ponds are cost effective, but require ecofriendly landowners when not on State property. To accomplish this the NPWS has put forth the Natterjack Toad Pond Farm Scheme <www.npws.ie> for Castlemaine Harbour and west of Castlegregory to create more ponds as recommended by Beebee (2002). This scheme offers financial incentives to farmers to place ponds on their land in the form of 500 euros for each of two ponds on the first ha of land. The farmer has a five year obligation to clear emergent vegetation by hand and maintain grazing. This scheme offers a mutually beneficial outcome for both conservation and economic goals, and hopefully will be popularly implemented. Resources should be used to place new ponds away from coastal areas that are already overwhelmed by the sea (e.g. Fermoyle, Inch, Glenbeigh) as global climate change will make them untenable. The 2007 UN Intergovernmental Panel on Climate Change predicts a global temperature increase of 2-4°C with an increase of 431.8mm in sea level by the end of the present century. Regional climate model predictions for Ireland are at <www.epa.ie>. Storm surges will also inundate coastal

regions of Kerry and Wexford. Therefore new pond placement has to be done with this inevitability in mind, as even some presently secure sites may be also threatened.

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FIGURE 1. Biologically productive scrape pond at Caherdaniel, Co. Kerry, with submerged vegetation and numerous natterjack tadpoles.

FIGURE 2. Newer unproductive scrape pond at Caherdaniel, Co. Kerry, with barren margins, no submerged vegetation or toad tadpoles.

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THE 'CONNOGH' AND THE 'ARGLOGHER': 17TH-CENTURY ANECDOTES ON NATURAL HISTORY AND FOLK-MEDICINE FROM CO. WESTMEATH

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Sir Henry Piers Baronet lived at Tristernagh near Ballynacarrigy, 12km north-west of Mullingar, Co. Westmeath, until his death in 1691. He was the son of William Piers, a Major in Cromwell's army who as a reward for his service was settled on the estates of the former Cistercian abbey at Tristernagh. At the request of Anthony Dopping, Lord Bishop of Westmeath, Henry Piers wrote *A chorographical description of the County of West-Meath* in 1682. It was not until 1770 that the work was first published in Volume 1 of *Collectanea de Rebus Hibernicus* by Major Charles Vallancey. In 1981, Meath Archaeological and Historical Association published an unabridged photographic facsimile of the second (1786) edition of *A chorographical description of the County of West-Meath*. It is an extract from this 1981 facsimile edition that forms the basis for this note.

A chorography is defined as 'the systematic description of regions or districts' (Allen, 1990). *A chorographical description of the County of West-Meath* includes observations on the geography, archaeology, folklore and 'natural productions' of Westmeath, as well as comments on recent upheavals in the county, particularly the events of the 1640 rebellion that occurred during Henry Piers' life-time.

The work appears to have escaped the notice of Irish natural historians. Neither Henry Piers nor his chorography are noted by Moriarty *in* Foster (1997) and are not indexed anywhere else in Foster (*op. cit.*). They do not appear anywhere in the indices of *The Irish Naturalist* or *The Irish Naturalists' Journal*. This omission is understandable, as the bulk of the work is unrelated to natural history. Those passages of interest to a naturalist are in the main general observations on the bogs, lakes and rivers of Westmeath, and the various types of fish inhabiting them.

One passage does merit being brought to the attention of modern Irish naturalists. Primarily

for its description of a seemingly terrifying and malevolent creature Piers calls the 'Connogh' worm, but also because the 'piseogs' and folk cures associated with another creature, the 'Arglogher' are still known today in parts of rural Ireland.

In the extract reproduced below the character 's' has been substituted for the f-like 's' in the type-face of the facsimile work. Spelling and punctuation are unchanged.

"It hath been observed of this island, that it fostereth no venomous or deadly animal in it, which certainly is a very great blessing, wherof few countries, that I hear of partake, except it be true what some have written of the island of Malta in the Mediterranean Sea; nevertheless we have a certain reptile found in our bogs and moorish pastures, called by the Irish the Connogh, it passeth my skill to make it speak English. This is an ugly worm, sometimes as thick as a man's thumb, about two or three inches long, having as all reptiles have, many short feet, a large head, great goggle eyes and glaring, between which riseth or jetteth forth, one thick bristle almost in shape like an horn, which is prominent and bendeth forward about three quarters of an inch. Whatever beast happeneth to feed, where this venomous worm hath crept (some say if he do but tread there) is certainly poisoned, yet may be infallibly cured, if timely remedy be applied. The case is twofold, yet in effect but one, both proceeding from the very worm itself. Some there are that take this worm, putting it into the hand of a new born child, close the hand about it, tying it up with the worm closed in it, 'till it be dead. This child ever after, by stroking the beast affected, recovers it, and so it will, if the water, wherein the child washeth, be sprinkled on the beast. I have known a man that thus would cure his neighbour's cattle, tho' he never saw them. The other method of cure, which I like much better, is by boring an auger-hole in a well grown willow tree, and in it imprisoning, but not immediately killing, the worm so close by a wooden peg, that no air may get in, and therein leaving him to die at leisure. The leaves and tender branches of this tree, ever after, if bruised in water and the affected beast therewith sprinkled, he is cured. The all- wise and ever gracious God, having thus in his providence ordered it, that not only this venomous reptile, but divers others, and who knows if not all, did we know the right method of using them should have in themselves their own antidotes, that so we might have a remedy at hand, as the poet sayeth: *Una eademque*

manus vulnus opemque ferat-Ovid (The hand that wounds applies the healing balm).

We have also in our bogs and low pasture grounds, and likewise on high moorish pasture, and mountains, a certain animal (rarely met with) in length about a span, having four feet resembling the hands of a man, palm, thumb, and fingers, from the hind foot backward it is as long as thence forward, but not so bulky, for it tapereth forth in length, and ends in a very small tail, without any sting that I could ever find. The best portrait that I can give of it is the crocodile in the maps and cuts of travellers and some geographers, which it seems to me in all parts to resemble, and to outward appearance is none other than a diminutive crocodile. They are of different colours; those found on the mountains are greyish and azure; those in our bogs are betwixt greyish and brown, speckled; some call them in the Irish tongue, Arglogher, which may be rendered the rush-pig, and others Askeloagher, or rush-eel. This animal, thus terrible to our outward view, is altogether harmless; and tho' its jaws be very wide and he at pleasure exerteth therout a very long and slender branched, forked tongue, resembling at full extent an anchor, the outwings of which he draweth up close so as not to be visible at pleasure, yet it never offereth to sting or eject any poison. It is a strange vivacious animal; for being kept in the open air, it will live a twelvemonth together without food or sustenance, more than what the element affords it. I have known a young man who for several months together, kept one of them prisoner on his hat, tyed by a thread to the hat band: it had more than half its long tail or hinder part cut off, yet this poor creature lived, and seemed lively and strong enough; how long he kept it in the whole time, and whether it died for lack of food or not, I cannot tell. I have told you this creature was no way noxious, I shall now tell you wherin it is helpful to man, and that under one of the saddest accidents or disasters, that sometimes befal us; whoever therefore shall be so hardy as to take this little formidable animal, and stroke the belly and tail therof three time against his tongue, drawing it against the scales of it, will ever after perfectly and speedily cure any burn or scald, and that by licking the part affected. This hath been confirmed to me from the certain knowledge and experience of a very honest gentleman, and a near neighbour."

Piers' makes a specific connection between the 'connogh' and an illness of cattle, both of which are reflected in Dineen's (1927): *Foclóir Gaedhilge agus Béarla -an Irish-English*

Dictionary: 1. Conaċ, -aiġ; m., a murrain; rabies; fierce spite, rage; 2. Conaċ, -aiġ; pl.id., m., the elephant hawk moth (*Choerocampa elpenor*); found in dark places and regarded with aversion; on being discovered it is instantly killed as it is believed to sting cattle severely in the muzzle; the ass is supposed to kill it; a beetle. *The concise Oxford English dictionary* (Allen, R. E. (ed.) 1990, eight edition), defines 'murrain' as: an infectious disease of cattle, caused by parasites. In de Bhaldraithe (1959), the word 'conach' does not appear as a translation of either hawk moth or murrain. Ó Dónaill (1977) gives the translation of 'conach' as: 1 Hawk moth, 2 Leech, 3 Murrain. In the Department of Education's (1978) booklet *Ainmneacha plandaí agus ainmhithe, flora and fauna nomenclature*, 'conach' is used as a generic name, thus: conach foluana (humming-bird hawk moth), conach na cealtrach (death's head hawk moth), and conach eilifinteach (elephant hawk moth).

Piers' description of the 'connogh' is somewhat misleading, placing the 'bristle' or 'horn' between the 'great goggle eyes' -suggesting that he rarely if ever examined the actual creature himself and that he had only a vague idea of what constituted a reptile. The caterpillar of the elephant hawk moth (*Deilephila elpenor* L.) (Lepidoptera: Sphingidae) in common with most other hawk moth caterpillars has a prominent horn on the twelfth abdominal segment, near the rear end, while the fourth and fifth segments carry the conspicuous false-eye spots. The front segments of the caterpillar's body taper towards the head, sometimes giving the caterpillar the appearance of an elephant's trunk.

On page 98, Ford (1955) states that "The 'eye-spots' on the larva of the Elephant Hawk, *Deilephila elpenor* L., Sphingidae enhance the alarming result produced when the creature swells out it's anterior segments, with a decidedly snake-like effect, as it does when danger threatens". On page 62, South (1977) mentions "When in repose the head and front ring are drawn inwards, and this distends the eyed rings, thus bringing these into prominence and giving the creature a rather wicked look, from which the uninitiated would be likely to retreat".

The present tense used in Dineen (1927) suggests that the fear of *Deilephila elpenor* among some country people, survived at least into the early part of the 20th-century. It would also be tempting, in light of modern scientific knowledge about the pharmaceutical properties of willow

Salix, to see the sprinkling of water over cattle, in which the 'leaves and tender branches' of willow have been 'bruised' as an early use of salicin, the compound in willow from which Aspirin (acetylsalicylic acid) was later derived. How the elephant hawk moth caterpillar became involved apart from having, as South (*op. cit.*) says 'a rather wicked look', is unclear.

The Arglogher (or 'earc luachra' -modern spelling, Ó Dónaill (*op. cit.*)) that Piers describes is clearly the viviparous lizard (*Zootoca vivipara* (Jacquin)) (Reptilia), Ireland's only native reptile; rather than the smooth newt (*Triturus vulgaris* (L.)) (Amphibia) which is also given by Ó'Dónaill (*op. cit.*) as a translation of 'earc luachra'. Piers refers to drawing the tongue 'against the scales of it' -reptiles have scales and amphibians do not. Referring to the creature tied to the young man's hat, Piers says "it had more than half its long tail or hinder part cut off, yet this poor creature lived" -an illustration of the viviparous lizard's ability to shed it's tail when seized by a predator, without any ill effects.

The full etymology of the term Arglogher and the variations of spelling and meaning are beyond the scope of the present note. Suffice it to say that Dineen (*op. cit.*), as well as 'earc luachra', also gives 'earc sléibhe -a species of lizard found on moors', while in Ó Dónaill (*op. cit.*) 'earc' is translated as a 'reptile', 'luachra' being a 'rushy place' or 'rushland'.

While teaching biology in a west of Ireland school in the early 1990's, local students drew the teacher's attention to the perceived benefits of licking the skin of an 'earc luachra' as a curative for burns, a belief that was also commonly held by the older population of the area (P. de Bhaldraithe, pers. comm.).

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RECORDS OF IRISH GALLS (FUNGI; INSECTA: COLEOPTERA, DIPTERA, HEMIPTERA, HYMENOPTERA, LEPIDOPTERA; ACARINA: ERIOPHYIDAE) INCLUDING EIGHT SPECIES NEW TO IRELAND AND ONE DELETION FROM THE IRISH LIST

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Abstract

Gall records of Fungi; Coleoptera, Diptera, Hemiptera, Hymenoptera, Lepidoptera and Eriophyidae are presented for Counties Clare, Cork, Galway, Kerry and Wexford. *Contarinia hypochoeridis* (Rübsaamen), *Dasineura angelicae* (Rübsaamen), *D. geranii* (Kieffer), *D. lathyri* (Kieffer), *Jaapiella vacciniorum* (Kieffer), *Lathyomyza schlechtendali* (Kieffer), *Acalitus plicans* (Nalepa) and *Aceria sanguisorbae* (Canestrini) are new to Ireland. *Acalitus blastophthirus* (Nalepa) is deleted from the Irish list.

Introduction

On separate visits to Ireland, JPB, MR and TH recorded galls and sent lists of their finds to JPOC. All three authors determined their material with Redfern, Shirley, and Bloxham (2002). However, TH also used Hancy (2000). Since these visits have yielded many interesting records

including seven additions to the Irish fauna, the data are reported here. Where known, new county records are indicated by the symbol *. The opportunity is also taken to delete *Acalitus blastophthirus* (Nalepa) from the Irish list (O'Connor, 2006). These specimens belong instead to *Acalitus plicans* (Nalepa) which is new to the island. A total of eight species is added therefore to the Irish fauna.The following abbreviations are used in the text:- BMS – B. M. Spooner; JPB – J. P. Bowdrey; JPOC – J. P. O'Connor; KMH – K. M. Harris; MR – M. Redfern and TH – T. Higginbottom.

THE GALL RECORDS

FUNGI

***Phragmidium rosae-pimpinellifoliae* Diet**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, MR.

The species occurred on burnet rose *Rosa pimpinellifolia* L.

***Physoderma pulposum* Wallr.**

GALWAY: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, identification confirmed by BMS, MR.

The species occurred on common orache *Atriplex patula* L.

***Puccinia annularis* (Str.) Röhl.**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, MR.

The species occurred on wood sage *Teucrium scorodonia* L.

***Puccinia buxi* DC**

KERRY: Derrynane House gardens V0505, 27 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB; Templenoe near Kenmare V0806, 23 August 2007, on a hedge outside an old house, identification confirmed from an image by BMS, JPB.

The species occurred on box *Buxus sempervirens* L.

***Synchytrium succisae* de Bary and Woronin**

CLARE: Mullagh More M3194, 14 July 2006, identification confirmed by BMS, MR.

The species occurred on devil's-bit scabious *Succisa pratensis* Moench.

***Taphrina alni* (Berk. and Br.) Gjaerum**

GALWAY: Yeat's House at Thoor Ballylee M4806, 21 August 2003, TH.

The species occurred on alder *Alnus glutinosa* (L.) Gaertner. The galls of *T. alni* were recorded from Counties Carlow, Galway, Roscommon, Tipperary, Waterford and Wexford by O'Connor (2004a) and by O'Connor and O'Connor (2000).

***Taphrina pruni* Tul.**

CLARE: Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR.

The species occurred on blackthorn *Prunus spinosa* L. The galls of *T. pruni* were recorded from Counties Dublin and Waterford by O'Connor (2004a).

***Taphrina tosquinetii* (Westend.) Magn.**

KERRY: Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB; Templenoe near Kenmare V0806, 25 August 2007, common in a plantation on saplings, JPB.

The species occurred on alder. The galls of T. *tosquinetii* were recorded from Co. Wexford by O'Connor (2006).

INSECTA: COLEOPTERA

***Cyanapion gyllenhali* (Kirby)**

CLARE: Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR.

The species occurred on tufted vetch *Vicia cracca* L. *C. gyllenhali* is widely distributed in Ireland including Co. Clare (Morris, 1993).

***Miarus campanulae* (L.)**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, gall and larva, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; near Kilnaboy R2891, 20 August 2003, on limestone pavement, TH; Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, by the road on the lower slope, TH; **GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR.

The species occurred on harebell *Campanula rotundifolia* L. Adults of *M. campanulae* were

recorded from Counties Clare, Galway and Longford by Johnson and Halbert (1902). Morris (1993) states that it is common in the Burren.

***Eutrichapion loti* (Kirby)**

KERRY: coast near Blackwater Bridge V0806, 25 August 2007, adults were reared from distorted pods, JPB.

The species occurred on common bird's-foot-trefoil *Lotus corniculatus* L. *E. loti* is widespread and common in Ireland (Morris, 1990). It has been recorded from Co. Kerry (Morris, 1993).

***Mecinus collaris* Germar**

***KERRY**: coast near Blackwater Bridge V0806, 25 August 2007, adults were reared, JPB.

The species occurred on sea plantain *Plantago maritima* L. *M. collaris* has been previously recorded from Belfast and, Counties Dublin, Wexford and Wicklow (Morris, 1993).

***Stenopterapion scutellare* (Kirby)**

KERRY: Kerry Way, Kenmare uplands V0907, 20 August 2007, one gall only, JPB.

The species occurred on western gorse *Ulex gallii* Planch. Adults of *S. scutellare* were recorded from Co. Kerry by Johnson and Halbert (1902).

INSECTA: DIPTERA – CECIDOMYiIIDAE

***Anisostephus betulinus* (Kieffer)**

***KERRY**: Kerry Way, Kenmare V0907, 28 August 2007, JPB.

The species occurred on downy birch *Betula pubescens* Ehrh. *A. betulinus* was previously recorded from Counties Armagh and Meath (O'Connor and Wistow, 1999).

***Contarinia hypochoeridis* (Rübsaamen) New to Ireland**

***CLARE**: Blackhead Point M1411, 11 and 15 July 2006, gall and larva, identification confirmed by KMH, MR.

The species occurred on common cat's ear *Hypochaeris radicata* L.

***Contarinia barbichei* (Kieffer)**

KERRY: Derrynane Dunes V0505, 27 August 2007, JPB; Templenoe near Kenmare V0806, 23

August 2007, white jumping larvae, JPB.

The species occurred on common bird's-foot-trefoil. *J. loticola* was previously recorded from Counties Clare, Kerry and Wexford (O'Connor, 2000; O'Connor, 2005a; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Contarinia loti* (De Geer)**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR.

The species occurred on common bird's-foot-trefoil. *C. loti* was previously recorded from Counties Clare, Kerry and Wexford (O'Connor, 2000, 2003, 2004b; O'Connor and Wistow, 1999).

***Dasineura angelicae* (Rübsaamen) New to Ireland**

KERRY: Templenoe near Kenmare V0806, 23 August 2007, on flowers, JPB.

The species occurred on wild angelica *Angelica sylvestris* L.

***Dasineura crataegi* (Winnertz)**

CLARE: east shore of Lough Bunny M3796, 14 July 2006, MR.

The species occurred on hawthorn *Crataegus monogyna* Jacq. *D. crataegi* was previously recorded from Counties Armagh, Clare, Dublin, Galway, Louth, Roscommon, Tipperary, Tyrone, Wexford and Wicklow (O'Connor, 2000, 2001, 2002, 2006; O'Connor, Wistow, Ashe and O'Connor, 1999)

***Dasineura fraxinea* Kieffer**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Mullagh More M3194, 14 July 2006, MR.

The species occurred on common ash *Fraxinus excelsior* L. *D. fraxinea* was previously recorded from Counties Clare, Dublin, Tipperary and Wexford (O'Connor, 2000, 2001; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Dasineura geranii* (Kieffer) New to Ireland**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, gall and larva, identification confirmed

by KMH, MR.

The species occurred on bloody crane's-bill *Geranium sanguineum* L.

***Dasineura lathyri* (Kieffer) New to Ireland**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, gall and larvae, confirmed by KMH, MR.

The species occurred on meadow vetchling *Lathyrus pratensis* L.

***Dasineura plicatrix* (Loew)**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, MR; **GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; **KERRY**: Derrynane House gardens V0505, 27 August 2007, JPB; Templenoe near Kenmare V0806, 23 August 2007, JPB.

The species occurred on bramble *Rubus fruticosus* agg. *D. plicatrix* was previously recorded from Counties Armagh, Clare, Galway, Kerry, Limerick, Tyrone, Westmeath and Wexford (O'Connor, 2000, 2002, 2003; O'Connor and Wistow, 1999).

***Dasineura pustulans* (Rübsaamen)**

CLARE: Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, lower slope by the road, TH; near Kilnaboy R2891, limestone pavement, 20 August 2003, TH; **GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB.

The species occurred on meadowsweet *Filipendula ulmaria* (L.) Maxim. *D. pustulans* was previously recorded from Counties Armagh, Carlow, Cavan, Clare, Galway, Kerry, Kilkenny, Limerick, Louth, Mayo, Roscommon, Tipperary, Tyrone and Waterford (O'Connor, 2000, 2001, 2002, 2003; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Dasineura rosae* (Bremi, 1847)**

synonym *Wachtliella rosarum* (Hardy)

***KERRY**: Templenoe near Kenmare V0806, 28 August 2007, JPB.

The species occurred on dog rose *Rosa canina* agg. *D. rosae* was previously recorded from Counties Armagh, Clare and Tyrone (O'Connor, 2000; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Dasineura rosaria* (H. Loew)**

Synonym *Rabdophaga cinerearum* (Hardy)

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, MR.

The species occurred on goat willow *Salix caprea* L. *D. rosaria* has been recorded from Counties Armagh, Cavan, Clare, Limerick and Meath (O'Connor, 2000, 2003; O'Connor and Wistow, 1999; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Dasineura spadicea* Rübsaamen**

CLARE: Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR.

The species occurred on tufted vetch. *Dasineura spadicea* was previously recorded from Counties Clare and Wexford (O'Connor, 2000; O'Connor and Wistow, 1999)

***Dasineura ulmaria* (Bremi)**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, MR; Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, lower slope by the road, TH; east shore of Lough Bunny M3796, 14 July 2006, MR; near Kilnaboy R2891, limestone pavement, 20 August 2003, TH; Vale of Clab M3001, 12 July 2006, MR; **GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: Derrynane National Park V0505, 27 August 2007, JPB; Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB; Templenoe near Kenmare V0806, 18 August 2007, JPB.

The species occurred on meadowsweet. *D. ulmaria* was previously recorded from Counties Antrim, Carlow, Clare, Cork, Derry, Dublin, Kerry, Laois, Limerick, Louth, Mayo, Meath, Roscommon, Sligo, Tipperary, Tyrone, Wexford and Wicklow (O'Connor, 2000, 2001, 2002, 2003; O'Connor, Wistow, Ashe and O'Connor, 1999; Shirley, 1999).

***Dasineura urticae* (Perris)**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, MR; ***CORK**: Healy Pass, Caha Mountains V0705, 24 August 2007, JPB; ***GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; **KERRY**: Derrynane House Gardens V0505, 27 August 2007, JPB; Kerry Way, Kenmare uplands V0907,

20 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB; Templenoe near Kenmare V0806, 18 August 2007, JPB.

The species occurred on common nettle *Urtica dioica* L. *D. urticae* was previously recorded from Counties Antrim, Armagh, Cavan, Clare, Down, Dublin, Kerry, Louth, Meath, Sligo, Tipperary, Tyrone, Wexford and Wicklow (O'Connor, 2000; O'Connor, Wistow, Ashe and O'Connor, 1999).

Dasineura viciae (Kieffer)

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, gall and larva, det. KMH, MR; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, gall and larva, MR.

The species occurred on bush vetch *Vicia sepium* L. *D. viciae* was previously recorded from Counties Antrim, Armagh, Clare, Down, Dublin, Kerry, Laois, Louth, Tyrone, Waterford, Wexford and Wicklow (O'Connor, 2000; O'Connor and Wistow, 1999; O'Connor, Wistow, Ashe and O'Connor, 1999).

Hartigiola annulipes **(Hartig)**

GALWAY: Coole Park near Gort M4304, 19 August 2003, TH; ***KERRY**: Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on common beech *Fagus sylvatica* L. *H annulipes* was previously recorded from Counties Armagh, Carlow, Cavan, Galway, Limerick, Louth, Offaly, Roscommon, Tipperary, Tyrone, Waterford, Westmeath and Wexford (O'Connor, 2001, 2002, 2003; O'Connor and Wistow, 1999; O'Connor, Wistow, Ashe and O'Connor, 1999).

Iteomyia capreae **(Winnertz)**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, *Salix caprea*, MR; Vale of Clab M3001, 12 July 2006, *Salix aurita*, MR; ***KERRY**: Templenoe near Kenmare V0806, 18 August 2007, *Salix* sp., JPB.

The species occurred on sallows. *I. caprea* was previously recorded from Counties Armagh, Cavan, Clare, Limerick, Tipperary, Tyrone, Westmeath and Wexford (O'Connor, 2000, 2001, 2003; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Iteomyia major* (Kieffer)**

***CLARE**: Holy Well near Keelhilla M3304, 16 July 2006, *Salix caprea*, MR; Vale of Clab M3001, 12 July 2006, *Salix aurita*, MR; ***KERRY**: Templenoe near Kenmare V0806, 25 August 2007, *Salix* sp., JPB.

The species occurred on sallows. *I. major* was previously recorded from Counties Armagh, Carlow, Kilkenny, Limerick, Meath, Tipperary, Waterford and Wexford (O'Connor, 2001, 2003; O'Connor and Wistow, 1999; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Jaapiella vacciniorum* (Kieffer) New to Ireland**

KERRY: Kerry Way, KenmareV0907, 28 August 2007, JPB.

The species occurred on bilberry *Vaccinium myrtillus* L.

***Jaapiella veronicae* (Vallot)**

***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: Derrynane House Gardens V0505, 27 August 2007, JPB; Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB.

The species occurred on germander speedwell *Veronica chamaedrys* L. *J. veronicae* was previously recorded from Counties Antrim, Armagh, Carlow, Clare, Cork, Down, Dublin, Kildare, Kerry, Laois, Limerick, Meath, Offaly, Roscommon, Sligo, Tipperary, Tyrone, Waterford, Wexford and Wicklow (O'Connor, 2002, 2003; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Kiefferia pericarpiicola* (Bremi)**

CLARE: Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, lower slope by the road, TH; near Kilnaboy R2891, limestone pavement, 20 August 2003, TH; **KERRY**: Allhies beach V0504, 24 August 2007, occasional, JPB; Coss Strand, Templenoe V0806, 21 August 2007, common, JPB.

The species occurred on wild carrot *Daucus carota* L. *K. pericarpiicola* was previously recorded from Counties Antrim, Cavan, Clare, Kerry, Kilkenny, Waterford, Wexford and Wicklow (O'Connor, 2000, 2001, 2003; O'Connor and Wistow, 1999; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Lathyomyza schlechtendali* (Kieffer)** **New to Ireland**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, gall and larvae, confirmed by KMH, MR.

The species occurred on bitter vetch *Lathyrus linifolius* (Reichard) Bässler.

***Rhopalomyia millefolii* (Loew)**

***KERRY**: Derrynane Dunes V0505, 27 August 2007, galling the flowers, axillary buds and leaves on grey dunes, JPB; Kenmare Harbour V0907, 30 August 2007, JPB; Kerry Way, Kenmare V0907, 28 August 2007, JPB; Killmakilloge Harbour, Beara V0705, 30 August 2007, JPB.

The species occurred on yarrow *Achillea millefolium* L. *R. millefolii* has been recorded from Counties Armagh and Westmeath (O'Connor, Wistow, Ashe and O'Connor, 1999).

***Rhopalomyia ptarmicae* (Vallot)**

***KERRY**: Muckross Lake, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on sneezewort *Achillea ptarmica* L. *R. ptarmicae* has been recorded from Counties Armagh, Clare and Tyrone (O'Connor, 2004a; O'Connor, Wistow, Ashe and O'Connor, 1999).

***Taxomyia taxi* (Inchbald)**

KERRY: Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on yew *Taxus baccata* L. *T. taxi* has been recorded from Co. Kerry (O'Connor, Wistow, Ashe and O'Connor, 1999).

INSECTA: HEMIPTERA - HOMOPTERA

***Hayhurstia atriplicis* (L.)**

GALWAY: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; **KERRY**: Coss Strand, Templenoe V0806, 23 August 2007, JPB.

The species occurred on *Atriplex* sp. The galls have been recorded from Counties Clare, Cork, Waterford and Wexford (O'Connor, O'Connor, Wistow and Ashe, 1998).

***Livia juncorum* (Latreille)**

KERRY: Kerry Way, Kenmare uplands V0907, 20 August 2007, common on higher ground, JPB.

The species occurred on jointed rush *Juncus articulatus* L.

***Psyllopsis fraxini* (L.)**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; **GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: Templenoe near Kenmare V0806, 23 August 2007, JPB.

The species occurred on common ash.

***Spanioneura buxi* (L.)**

KERRY: Muckross House grounds, Killarney National Park V0908, 9 August 2007, JPB.

The species occurred on box.

***Trioza alacris* Flor**

***KERRY**: Muckross House grounds, Killarney National Park V0908, 9 August 2007, JPB.

The species occurred on bay laurel *Laurus nobilis* L. *T. alacris* has been previously recorded from Co. Dublin (O'Connor, Ashe and Wistow, 1997).

INSECTA: HYMENOPTERA

***Andricus curvator* Hartig**

GALWAY: Coole Park near Gort M4304, 19 August 2003, oak, TH; Yeat's House at Thoor Ballylee M4806, 21 August 2003, oak, TH; **KERRY**: Templenoe near Kenmare V0806, 23 August 2007, sessile oak, JPB.

The curved leaf gall of this species occurred on oak. *A. curvator* is widely distributed in Ireland (O'Connor, 2004b).

***Andricus fecundator* Hartig**

KERRY: Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB; Templenoe near Kenmare V0806, 23 August 2007, JPB.

The artichoke gall of this species occurred on sessile oak. *A. fecundator* is widely distributed

in Ireland (O'Connor, 2004b).

***Andricus kollari* (Hartig)**

KERRY: lane to Coss Strand, Templenoe V0806, 21 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The marble gall of this species occurred on sessile oak. *A. kollari* is widely distributed in Ireland (O'Connor, 2004b).

***Andricus lignicolus* (Hartig)**

KERRY: lane to Coss Strand, Templenoe V0806, 21 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The cola-nut gall of this species occurred on sessile oak. *A. lignicolus* is widely distributed in Ireland (O'Connor, 2004b).

***Andricus quercuscalicis* Burgsdorf**

KERRY: Kenmare V0807, 26 August 2007, JPB; Templenoe near Kenmare V0806, 25 August 2007, on road, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The knopper gall of this species occurred on sessile oak. *A. quercuscalicis* is widely distributed in Ireland (O'Connor, 2004b).

***Andricus quercuscorticis* (L.)**

KERRY: Templenoe near Kenmare V0806, 23 August 2007, old gall, JPB;

The bark gall of this species occurred on sessile oak. *A. quercuscorticis* was previously recorded from Counties Cavan, Cork, Dublin, Kerry, Kildare, Leitrim, Wexford and Wicklow (O'Connor, 2004b).

***Andricus quercusradicis* (Fabr.)**

KERRY: Templenoe near Kenmare V0806, 23 August 2007, 2m up on a damaged bough, JPB.

The truffle gall of this species occurred on sessile oak. *A. quercusradicis* is widely distributed in Ireland (O'Connor, 2004b).

***Cynips divisa* Hartig**

CORK: Geninchaquin Park, Beara V0806, JPB; **KERRY**: Templenoe near Kenmare V0806,

18 August 2007, JPB.

The pea gall of this species occurred on sessile oak. *C. divisa* is widely distributed in Ireland (O'Connor, 2004b).

***Cynips quercusfolii* L.**

KERRY: Templenoe near Kenmare V0806, 25 August 2007, JPB.

The cherry gall of this species occurred on sessile oak. *C. quercusfolii* is widely distributed in Ireland (O'Connor, 2004b).

***Diplolepis rosae* (L.)**

***KERRY**: Kerry Way, Kenmare uplands V0907, 20 August 2007, one gall only, JPB.

The bedeguar gall of this species occurred on dog rose. *D. rosae* has been previously recorded from Counties Armagh, Clare, Cork, Dublin, Laois, Louth, Mayo, Meath, Tipperary and Wicklow (O'Connor, 2004b).

***Diplolepis spinosissimae* (Giraud)**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Blackhead Point M1411, 11 and 15 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, on the lower slope by the road, TH; Mullagh More M3194, 14 July 2006, MR; near Kilnaboy R2891, on limestone pavement, TH; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; ***KERRY**: Derrynane Dunes V0505, 27 August 2007, common on grey dune, JPB.

The galls of this species occurred on burnet rose. *D. spinosissimae* has been previously recorded from Counties Clare, Dublin and Wexford (O'Connor, 2004b).

***Neuroterus anthracinus* (Curtis)**

GALWAY: Coole Park near Gort M4304, 19 August 2003, oak *Quercus*, TH; Yeat's House at Thoor Ballylee M4806, 21 August 2003, oak, TH; **KERRY**: Templenoe near Kenmare V0806, 18 August 2007, sessile oak *Quercus petraea* (Mattuschka) Liebl, JPB.

The oyster gall of this species occurred on oak. *N. anthracinus* is widely distributed in Ireland (O'Connor, 2004b).

***Neuroterus numismalis* (Fourcroy)**

GALWAY: Coole Park near Gort M4304, 19 August 2003, oak, TH; Yeat's House at Thoor Ballylee M4806, 21 August 2003, oak, TH; **KERRY**: Kerry Way, Kenmare uplands V0907, 20 August 2007, sessile oak, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, sessile oak, JPB; Templenoe near Kenmare V0806, 18 August 2007, sessile oak, JPB.

The silk-button gall of this species occurred on oak. *N. numismalis* is widely distributed in Ireland (O'Connor, 2004b).

***Neuroterus quercusbaccarum* (L.)**

GALWAY: Yeat's House at Thoor Ballylee M4806, 21 August 2003, oak, TH; **KERRY**: lane to Coss Strand, Templenoe V0806, 21 August 2007, JPB.

The common spangle gall of this species occurred on sessile oak. *N. quercusbaccarum* is widely distributed in Ireland (O'Connor, 2004b).

***Phanacis hypochoeridis* (Kieffer)**

CLARE: Holy Well near Keelhilla M3304, 16 July 2006, MR; Mullagh More M3194, 14 July 2006, MR.

The species occurred on common cat's ear. *P. hypochoeridis* has been recorded from Co Clare (O'Connor, 2004b).

***Pontania bridgmanii* (Cameron)**

***CLARE**: Blackhead Point M1411, 11 and 15 July 2006, *Salix caprea*, MR; ***KERRY**: lane to Coss Strand, Templenoe V0806, 21 August 2007, *Salix* sp., JPB.

The species occurred on sallows. *P. bridgmanii* was previously recorded from Counties Cavan, Dublin and Wicklow (O'Connor, Liston and Speight, 1997).

***Pontania collactanea* (Förster)**

***GALWAY**: Coole Park near Gort M4304, 19 August 2003, by the lake, TH.

The species occurred on creeping willow *Salix repens* L. *P. collactanea* was previously recorded from Counties Cavan, Dublin and Wicklow (O'Connor, Liston and Speight, 1997).

***Pontania gallarum* (Hartig)**

***GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH.

The species occurred on goat willow. *P. gallarum* was previously recorded from Co. Westmeath (O'Connor, 2005b).

***Pontania pedunculi* (Hartig)**

***CLARE**: east shore of Lough Bunny M3796, 14 July 2006, *Salix cinerea*, MR; ***KERRY**: lane to Coss Strand, Templenoe V0806, 21 August 2007, *Salix* sp., JPB.

The species occurred on sallows. *P. pedunculi* was previously recorded from Counties Cavan, Donegal, Dublin, Mayo, Monaghan and Wicklow (O'Connor, Liston and Speight, 1997).

INSECTA – LEPIDOPTERA

***Adaina microdactyla* Hübner**

KERRY: Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on hemp agrimony *Eupatorium cannabinum* L.

ARACHNIDA - ERIOPHYOIDEA

***Acalitus plicans* (Nalepa)** **New to Ireland**

WEXFORD: J. F. Kennedy Arboretum (S7219), abundant on a hedge of beech, 6 August 2005, JPOC.

These galls were previously identified as *A. blastophthirus* (Nalepa) using Redfern, Shirley, and Bloxham (2002). However, Robbins (*in litt.* 4 September 2006) pointed out that this could be a misdetermination and provided extra characters for separating *A. blastophthirus* and *A. plicans*. There is also a colour plate of *A. plicans* in Alford (1994). Using this additional information, the Wexford material was re-examined and proved to belong to *A. plicans*. *A. blastophthirus* should be deleted therefore from the Irish list.

***Aceria cephaloneus* (Nalepa)**

***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR.

The species occurred on sycamore *Acer pseudoplatanus* L. *A. cephaloneus* was previously recorded from Counties Dublin and Waterford (O'Connor, 2006).

***Aceria erineus* (Nalepa)**

***KERRY**: Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on walnut *Juglans regia* L. *A. erineus* was previously recorded from Co Dublin (O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aceria galiobia* (Canestrini)**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, MR; east shore of Lough Bunny M3796, 14 July 2006, MR; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; **KERRY**: Derrynane Dunes V0505, 27 August 2007, JPB.

The species occurred on lady's bedstraw *Galium verum* L. *A. galiobia* was previously recorded from Counties Clare, Cork, Dublin and Kerry (O'Connor, 2000, 2001, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aceria geranii* (Canestrini)**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Blackhead Point M1411, 11 and 15 July 2006, MR; Lough Bunny R3796, 20 August 2003, TH; Mullagh More/Slieve Roe R3496, 22 August 2003, lower slope by the road, TH; Mullagh More M3194, 14 July 2006, MR; near Kilnaboy R2891, limestone pavement, 20 August 2003, TH; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR.

The species occurred on bloody crane's-bill. *A. geranii* was previously recorded from Counties Clare and Dublin (O'Connor, 2000; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aceria iteinus* (Nalepa)**

KERRY: lane to Coss Strand, Templenoe V0806, 21 August 2007, JPB.

The species occurred on sallow *Salix* sp. *A. iteinus* was previously recorded from Counties Kerry, Kildare, Kilkenny, Roscommon and Tipperary (O'Connor, 2001, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aceria pseudoplatani* (Corti)**

GALWAY: Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: lane to Coss Strand,

Templenoe V0806, 21 August 2007, JPB.

The species occurred on sycamore. *A. pseudoplatani* was previously recorded from Counties Cavan, Clare, Dublin, Galway, Kerry, Limerick, Roscommon, Tipperary, Waterford and Wexford (O'Connor, 2000, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aceria sanguisorbae* (Canestrini)** **New to Ireland**

CLARE: Mullagh More/Slieve Roe R3496, 22 August 2003, lower slope by the road, TH.

The species occurred on salad burnet *Sanguisorba minor* Scop.

***Aceria thomasi* (Nalepa)**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Blackhead Point M1411, 11 and 15 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; Mullagh More M3194, 14 July 2006, MR.

The species occurred on wild thyme *Thymus polytrichus* A. Kern. ex Borbás. *A. thomasi* was previously recorded from Counties Clare and Sligo (O'Connor, 2000; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Aculus anthobius* (Nalepa)**

***CLARE**: Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR.

The species occurred on cleavers *Galium aparine* L. *A. anthobius* was previously recorded from Co. Kerry (O'Connor, 2003).

***Cecidophyes galii* (Karpeles)**

CLARE: Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR; ***GALWAY**: Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; ***KERRY**: Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on cleavers. *C. galii* has been recorded from Counties Cavan, Clare, Cork, Dublin, Tipperary, Waterford, Westmeath and Wexford (O'Connor, 2000, 2001; O'Connor, O'Connor, Ashe and Wistow, 1999; O'Connor and Wistow, 1999).

***Eriophyes laevis* (Nalepa)**

GALWAY: Yeat's House at Thoor Ballylee M4806, 21 August 2003, TH; **KERRY**: Kerry

Way, Kenmare uplands V0907, 20 August 2007, JPB.

The species occurred on alder. *E. laevis* was previously recorded from Counties Carlow, Cavan, Derry, Galway, Kerry, Kildare, Limerick, Roscommon, Tipperary, Waterford and Wexford (O'Connor, 2001, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999; Shirley, 1999).

***Eriophyes leiosoma* (Nalepa)**

***GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH.

The species occurred on large-leaved lime *Tilia platyphyllos* Scop. *E. leiosoma* was previously recorded from Counties Cavan, Dublin, Kerry, Limerick, Roscommon, Waterford, Westmeath and Wexford (O'Connor, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Eriophyes prunispinosae* Nalepa**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Blackhead Point M1411, 11 and 15 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; east shore of Lough Bunny M3796, 14 July 2006, MR; Vale of Clab M3001, 12 July 2006, MR; ***GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; Inishmore, Aran Islands L05-13/75-92, 17-20 July 2006, MR; **KERRY**: lane to Coss Strand, Templenoe V0806, 21 August 2007, JPB.

The species occurred on blackthorn. *E. prunispinosae* was previously recorded from Counties Carlow, Clare, Dublin, Kerry, Kildare, Limerick, Mayo, Meath, Tyrone, Waterford, Westmeath and Wexford (O'Connor, 2000, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Eriophyes similis* (Nalepa)**

***GALWAY**: ***KERRY**: Templenoe near Kenmare V0806, 23 August 2007, JPB.

The species occurs on wild plum *Prunus domestica* L. *E. similis* was previously recorded from Counties Derry and Meath (O'Connor, 2004b; O'Connor and Wistow, 1999; Shirley, 1999).

***Aceria thomasi* (Nalepa)**

CLARE: Blackhead Point M1411, 11 and 15 July 2006, MR; above Ailwee Cave M2304, 12 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR.

The species occurred on wild thyme. *A. thomasi* was previously recorded from Counties Clare and Sligo (O'Connor, 2000; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Phytoptus avellanae* Nalepa**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; east shore of Lough Bunny M3796, 14 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; Vale of Clab M3001, 12 July 2006, MR.

The species occurred on hazel *Corylus avellana* L. *P. avellanae* was previously recorded from Counties Clare, Fermanagh, Kerry, Kilkenny, Limerick, Louth, Mayo, Tipperary, Waterford, Westmeath and Wexford (O'Connor, 2000, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

***Phyllocoptes goniothorax* Nalepa**

CLARE: above Ailwee Cave M2304, 12 July 2006, MR; Holy Well near Keelhilla M3304, 16 July 2006, MR; Martello Tower – Lough Murree, Ballyvaghan M2511, 11 July 2006, MR; Mullagh More M3194, 14 July 2006, MR; east shore of Lough Bunny M3796, 14 July 2006, MR; Vale of Clab M3001, 12 July 2006, MR; **GALWAY**: Coole Park near Gort M4304, 19 August 2003, TH; **KERRY**: Kerry Way, Kenmare uplands V0907, 20 August 2007, JPB; Muckross House grounds, Killarney National Park V0908, 29 August 2007, JPB.

The species occurred on hawthorn. *P. goniothorax* was previously recorded from Counties Cavan, Clare, Dublin, Galway, Kerry, Kildare, Limerick, Louth, Mayo, Meath, Roscommon, Tipperary, Tyrone, Waterford, Westmeath, Wexford and Wicklow (O'Connor, 2001, 2002, 2003; O'Connor, O'Connor, Ashe and Wistow, 1999).

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CRUSTACEAN RECORDS FROM LOUGH HYNE (INE), CO. CORK, IRELAND: PART VIII

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This is the eighth contribution in a series on the crustacean fauna of Lough Hyne (Ine) (W0928), the marine nature reserve in West Cork, and reports on additions and amendments to earlier lists (e.g. Holmes, 1980, 2002). Seven of the species listed are new to Ireland.

The author has been interested in the crustacean fauna of Lough Hyne for over 30 years and, during this period there have been some changes in the names and identifications of some of the species mentioned in previous contributions. New identification guides have been published, genera have changed and some taxonomic difficulties have been resolved. The relevant changes are mention in this paper.

All material was collected by the author (JMCH), in some cases with an underwater light-trap (Holmes and O'Connor, 1988). New Irish records are indicated by the symbol *. Voucher specimens have been deposited in the National Museum of Ireland (NMI).

MYODOCOPIDA

A revision of the marine planktonic ostracods of the north Atlantic by Angel (1993) has prompted a re-assessment of cylindroleberidid records from Lough Hyne. Previous work by the author was based on old works such as Brady and Norman (1896).

The *Asteropina mariae* (Baird) recorded from the South Basin of Lough Hyne by Holmes (1983) is now known to be the elongate oval female of *Synasterope norvegica* (G. O. Sars, 1869). The *Parasterope muelleri* (Skögsberg) of Holmes (1985) and Holmes and O'Connor (1991) is actually the elongate irregularly-shaped male of *S. norvegica*. There is also present a smaller more rounded myodocopan ostracod which is *Parasterope muelleri* (Skögsberg, 1920). As a result, two cylindroleberidid ostracods are now known to occur in Lough Hyne.

***Parasterope muelleri* (Skögsberg, 1920)**

Taken occasionally in light-traps in the South Basin.

***Synasterope norvegica* (G. O. Sars, 1869)**

Males and females were frequent and abundant in light-traps in all parts of Lough Hyne.

PODOCOPIDA

****Propontocypris pirifera* (G. W. Müller, 1894) New to Ireland**

Barloge Creek (W101279), coarse shell gravel, ♂ 26 July 1985 (NMI).

This ostracod is associated with algae in brackish and marine shallow water (Athersuch *et al*., 1989). It is similar to *P. trigonella* (Sars), with which it lives in the Barloge.

HARPACTICOIDA

****Dactylopusioides macrolabris* (Claus, 1866) New to Ireland**

Rapids area (W100281), rocks, ♀ 11 September 2003 (NMI).

This spectacular rusty-red copepod is compressed and streamlined to fit in with its burrowing habit in macrophyte algae. Originally described from the Mediterranean, it is also known in the British Isles from Torquay (Green, 1958).

****Bulbamphiascus incus* Gee, 2005 New to Ireland**

Following the revision of the genus *Bulbamphiascus* by Gee (2005), it is clear that specimens of *B. imus* (Brady) recorded from Lough Hyne by Holmes (1985) should be re-assigned to the newly-described *B. incus*. In addition, the other material in NMI collected by Dr C. E. O'Riordan in the Dublin Bay area (O'Riordan, 1971) also belongs to *B. incus*. *B. incus* was described from the West of Scotland, but its distribution may well to be widespread.

****Typhlamphiascus confusus* (T. Scott, 1902) New to Ireland**

Barloge Creek (W100279), muddy gravel, 4♂♂ 15 September 2003 (NMI).

Known from Norway, the North Sea, and the Scilly Isles.

***Stenocopia longicaudata* (T. Scott, 1892)**

Barloge Creek (W100279), muddy gravel, ♀ 16 September 2003 (NMI).

Otherwise known in Ireland from sites in Co. Galway (Holmes and O'Connor, 1990).

***Troglophonte spelaea* (Chappuis, 1938)** **New to Ireland**

Barloge Creek (W100280), gravel, ♀ 7 July 1994 (NMI).

Described from freshwater caves close to the littoral zone, in southern Italy. The same species has recently been found at Carraroe, Co. Galway, in May 2001, by Dr E. McCormack, (pers. comm.).

SIPHONOSTOMATOIDA

***Asterocheres ellisi* Hamond, 1968** **New to Ireland**

Rapids area (W100282), rocks and holdfasts, ♀ 8 August 1992; South Basin (W099283), rocks, ♀ 1 July 1996 (NMI); South Basin (W099283), rocks, ♂♀ 8 July 1999; South Basin (W095283), weed and rock, 1m, ♀ 27 June 2002.

A sponge associate, described from Norfolk.

CYCLOPOIDA

***Oncaea media* Giesbrecht, 1891**

Barloge Creek (W100279), clean gravel, 15 September 2003 (NMI).

A cosmopolitan planktonic species.

THORACICA

***Dosima fascicularis* (Ellis and Solander, 1786)**

Rapids area (W100282), colony floating at the surface, 19 July 2006 (NMI).

This stalked barnacle produces its own float, and is part of the surface plankton. Kitching (1987) recorded it in Barloge Creek. Minchin (1996) mapped strandings around the coast of Ireland. Its occurrence tends to be sporadic, but many colonies were observed in the open sea off West Cork in July 2006.

CUMACEA

***Diastylis laevis* Norman, 1869**

South Basin (W098282), light-trap, 20m, ♂ 13 September 2007 (NMI).

This species is a sand-dweller, and must be considered rare in Lough Hyne due to the lack of suitable habitat.

ISOPODA

***Jaera nordica* Lemercier, 1958**

Specimens which were recorded by Holmes (1980), under the name *Jaera nordmanni* (Rathke), should be referred to *J. nordica*. This species is abundant under stones in the north-west corner of the lough (W092289) where a small freshwater stream flows in.

AMPHIPODA

***Harpinia crenulata* (Boeck, 1871)**

Barloge Creek (W100279), muddy gravel, ♀ 16 September 2003 (NMI).

This species was recorded by in Lough Hyne by Costello and Myers (1987), but the above is the first specimen to be found by JMCH.

***Bathyporeia guilliamsoniana* (Bate, 1856)**

South Basin (W098283), light-trap, 20m, 1 specimen, 12 September 2007 (NMI).

Bathyporeia spp are frequently taken in light-traps set on sand at various localities around the coast of Ireland (Holmes, 2007). However, the above specimen from Lough Hyne is the first member of its family to be found in this water-body, despite collecting over many years. This would indicate that *Bathyporeia* is genuinely rare in the Nature Reserve, probably due to the absence of a suitable sandy habitat.

***Stenothoe tergestinum* (Nebeski, 1881) New to Ireland**

Whirlpool Cliff (W100283), light-trap, 20m, 2 specimens, 9 September 2007 (NMI).

This species is widespread in the Mediterranean and on the Atlantic coast of France. There are isolated records from Britain:- Eddystone Rocks (Lincoln, 1979) and Milford Haven

(Nelson-Smith and Case, 1984 as *S. spinimana* Chevreux) but it normally associated with more temperate waters than those found around Ireland.

***Ischyrocerus fractus* King and Holmes, 2004**

South Basin (W097280), light-trap, numerous specimens, 1981-2002 (NMI); Castle Island (W095283), red sponge and red algae, nine specimens, 2 August 1985 (NMI).

This recently-described species is known only from Lough Hyne (King and Holmes, 2004). Material collected with a light-trap was in reasonable condition but specimens collected by hand from weed were invariably in fragments with most of their appendages missing. This may account for the species not having been found elsewhere.

***Pariambus typicus* (Krøyer, 1844)**

Barloge Creek (W100279), 2m, 1 specimen, 27 July 2006 (NMI).

A sub-littoral species, Irish records were listed by Costello *et al*. (1990) and Holmes (2007).

DECAPODA

Holmes (1980) recorded the ditch shrimp *Palaemonetes varians* (Leach) as being present in Lough Hyne. Voucher specimens in NMI, collected by JMCH in the north-west corner of the lough where a small freshwater stream flows in, a likely site for *Palaemonetes*, were re-examined with a new key and were found to be the common *Palaemon elegans* Rathke, 1837. *P. elegans* is abundant in shallow water all round the lough, but it is now uncertain whether *Palaemonetes* occurs there. Re-collecting in the same site in September 2007 failed to reveal any *Palaemonetes*.

***Processa edulis* (Risso, 1816)**

Barloge Creek (W100279), over muddy gravel, 1 specimen, 16 September 2003 (NMI).

Processid shrimps are abundant in the deeper parts of Lough Hyne, but all specimens so far taken in light-traps are *Processa nouveli* subspecies *holthuisi* Al-Adhub and Williamson, and *P. edulis* has not been found in the lough itself.

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MORE RECORDS FOR UNCOMMON SPIDERS (ARANEAE), INCLUDING FOUR SPECIES NEW TO IRELAND

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Introduction

The following article is the third in a series detailing distribution records for uncommon Irish spiders. As on the two previous occasions (Cawley, 2001, 2004), species are generally included if they have been reported from four or fewer Irish counties. However this criterion is not rigidly followed, with some more widespread spiders included if the new information is deemed to be of interest. Also a full list of spiders is given for some of the more interesting sites, especially if some of the traditionally grossly under recorded counties are involved. New county records are denoted by an asterisk *. Four of the species included, *Silometopus incurvatus* (O. P.-Cambridge), *Centromerus albidus* Simon, *Philodromus praedatus* O. P.-Cambridge and *Philodromus albidus* Kulczyński have not previously been reported from Ireland. Again, and unless stated otherwise, nomenclature and sequence follows Merrett and Murphy (2000), and spiders were identified using Roberts (1985-1987, 1993). If one follows strictly the taxonomic approach of Merrett and Murphy (2000), and include the present article as well as the contributions of Cawley and Nolan (2007), Nolan (2007), Nolan and McCormack (2004) and Oxbrough (2007) the Irish spider fauna now comprises 410 species.

***Steatoda grossa* (C. L. Koch)**

CORK: Cuskinny W8166, 1 February 2006, subadult ♀ among dry rank vegetation on a sea cliff. An unusual record for this synanthrophic spider generally found inside, or immediately outside, buildings.

***Theridion tinctum* (Walckenaer)**

DUBLIN: *Clondalkin Bridge O069321, 30 August 2006, ♀ on the sides of a metal goods container which was being used as a shed, on the banks of the Grand Canal. Drimnagh O112327, 28 April 2007, subadult ♀ on railings, again on the banks of the Grand Canal; **TIPPERARY**: *Clonmel S200224, 7 June 2007, 3♀♀ beaten from yew *Taxus baccata* L. in a Church of Ireland graveyard, with *Tetragnatha obtusa* C. L. Koch (2♂♂3♀♀) also present.

The only other authentic Irish record appears to be from Co. Kilkenny (Cawley, 2004). Seemingly widespread in Dublin City, and could yet prove widespread in the south-east of Ireland.

***Enoplognatha latimana* Hippa and Oksala**

CORK: Ballintemple W702710, 19 July 2004, 2♂♂ beaten from rank vegetation in disused quarry. Marino Point W777688, 23 July 2004, ♀ beaten from rank grass verge bordering path. Youghal X102766, 30 July 2004, 2♂♂2♀♀ beaten from rank vegetation on hillside. The Glen W6873, 5 September 2004, ♀ beaten from rank vegetation on hillside. Carrigtohill Industrial Estate W8073, 7 August 2006, 2♂♂6♀♀ beaten from rank grassland; **WATERFORD**: Ballyvooney Bridge X330949, 22 August 2007, 2♂♂ beaten from vegetation on coastal bank.

Added to the Irish list by Cawley (2004), and clearly a predictable spider of rank grassland in Cork City. Invariably present with and outnumbered by the ubiquitous *Enoplognatha ovata* (Clerck).

***Robertus arundineti* (O. P.-Cambridge)**

CORK: *Mill Cove W277343, 13 March 2008, gravid ♀♀ under stones on a shingle bank at the pier. Notable in that all previous Irish records for this local spider have been from the northern half of the country, as far south as counties Dublin and Galway.

***Walckenaeria clavicornis* (Emerton)**

CAVAN: Legnavenagh H081358, 14 May 2008, **W. clavicornis* (♀) beaten from *Calluna* in a blanket bog. Other spiders collected from ground layer mosses and beaten from *Calluna* included the uncommon **R. arundineti* (2♀♀) and **Agyneta olivacea* (Emerton) (2♂♂), as well as **Nesticus cellulanus* (Clerck) (immatures), *Dismodicus bifrons* (Blackwall) (3♂♂7♀♀),

Peponocranium ludicrum (O. P.-Cambridge) (♂6♀♀), **Silometopus elegans* (O. P.-Cambridge) (♂), *Gongylidiellum vivum* (O. P.-Cambridge) (♂), *Araeoncus crassiceps* (Westring) (♀), **Aphileta misera* (O. P.-Cambridge) (♂♀), **Centromerita concinna* (Thorell) (♀), *Bolyphantes luteolus* (Blackwall) (♂), *Lepthyphantes alacris* (Blackwall) (♀), *Lepthyphantes obscurus* (Blackwall) (3♂♂6♀♀), *Lepthyphantes tenuis* (Blackwall) (♂), *Lepthyphantes zimmermanni* Bertkau (2♀♀), *Neriene clathrata* (Sundevall) (♂), **Tetragnatha extensa* (L.) (2♀♀), *Metellina mengei* (Blackwall) (2♂♂♀), *Metellina merianae* (Scopoli) (♀), *Araneus diadematus* Clerck (subadult), *Pardosa pullata* (Clerck) (3♀♀), *Pirata piraticus* (Clerck) (♂3♀♀), **Antistea elegans* (Blackwall) (subadults), **Dictyna arundinacea* (L.) (♂), *Clubiona reclusa* O. P.-Cambridge (♂), **Clubiona trivialis* C. L. Koch (3♀♀), **Micaria pulicaria* (Sundevall) (♀) and *Xysticus cristatus* (Clerck) (♀); **ROSCOMMON**: Drumbane, M511685, 19 January 2008. **W. clavicornis* (1♂) sieved from wet moss collected in a cut-over blanket bog. Other spiders collected, from mosses and from debris under hard-fern *Blechnum spicant* (L.) included the uncommon **Pelecopsis mengei* (Simon) (♂), as well as **Episinus angulatus* (Blackwall) (subadult ♂), **Pholcomma gibbum* (Westring) (♂4♀♀), **Walckenaeria acuminata* Blackwall (2♀♀), **Walckenaeria antica* (Wider) (♀), **Walckenaeria cuspidata* Blackwall (♀), *Gonatium rubens* (Blackwall) (3♀♀), **P. ludicrum* (subadult ♂), *Oedothorax gibbosus* (Blackwall) (♀), *Monocephalus fuscipes* (Blackwall) (♀), **Monocephalus castaneipes* (Simon) (♀), **Micrargus herbigradus* (Blackwall) (♀), *Erigonella hiemalis* (Blackwall) (♂♀), *Savignia frontata* Blackwall (♂), *Erigone atra* Blackwall (2♀♀), **C. concinna* (♀), *Pachygnatha degeeri* Sundevall (♂), **Metellina segmentata* (Clerck) (2♀♀), **Hahnia montana* (Blackwall) (♀), *Clubiona comta* C. L. Koch (subadult ♂) and **Ozyptila atomaria* (Panzer) (♂).

***Baryphyma gowerense* (Locket)**

WEXFORD: *Ballyteige Burrow S9405, 26 May 2005, ♂ located in sand dunes. Castlebridge T0426, 21 June 2005, ♀ in salt march and ♂♀ in adjacent *Phragmites* stand, with **Bathyphantes setiger* F. O. P.-Cambridge (♀) also present.

***Silometopus incurvatus* (O. P.-Cambridge) New to Ireland**

DONEGAL: Beefpark G887766, 2 November 2005. *S. incurvatus* (♂2♀♀), sieved from

ground layer moss. Other spiders present were *Oonops pulcher* Templeton (4♂♂9♀♀), *Ero cambridgei* Kulczyński (♀), **Enoplognatha thoracica* (Hahn) (♂3♀♀ all subadults), *P. gibbum* (4♂♂15♀♀), *Theonoe minutissima* (O. P.-Cambridge) (3♂♂6♀♀), *W. acuminata* (♂), *Walckenaeria unicornis* O. P.-Cambridge (2♂♂♀), *P. ludicrum* (3 subadult ♂♂), **Tapinocyba praecox* (O. P.-Cambridge) (3♂♂2♀♀), *G. vivum* (2♂♂), *E. atra* (2♂♂), *Erigone arctica* (White) (3♀♀), *Leptorhoptrum robustum* (Westring) (♀), *Centromerus prudens* (O. P.-Cambridge) (♀), *Centromerus dilutus* (O. P.-Cambridge) (2♂♂ 3♀♀), *C. concinna* (2♀♀), *Bathyphantes gracilis* (Blackwall) (♀), *L. tenuis* (3♂♂ 2♀♀), *Lepthyphantes mengei* Kulczyński (♂), *Lepthyphantes ericaeus* (Blackwall) (♀), *N. clathrata* (♀), *P. degeeri* (♂♀), **M. segmentata* (♀), *M. mengei* (3♂♂), *P. pullata* (♀), **Hahnia nava* (Blackwall) (2♂♂♀), **Clubiona stagnatilis* Kulczyński (♂), *Clubiona phragmitis* C. L. Koch (2♂♂♀), *Clubiona neglecta* O. P.-Cambridge (♀), **Clubiona diversa* O. P.-Cambridge (♂), *Haplodrassus signifer* (C. L. Koch) (near adult ♀), *Drassyllus pusillus* (C. L. Koch) (subadults), *M. pulicaria* (3 subadult ♀♀), *X. cristatus* (♀) and **Xysticus erraticus* (Blackwall).

The site comprises a small patch of sand dunes, severely disturbed in part, and with some invasion by blackthorn *Prunus spinosa* L. *S. incurvatus* is a rare spider restricted in Great Britain to a handful of northern sand dune sites which are mapped by Harvey *et al*. (2002).

***Mecopisthes peusi* Wunderlich**

MEATH: Mornington, O1575, 11 January 2006. *M. peusi* (♂) sieved from moss collected in an extensive area of disturbed sand dunes. Other rare spiders present were **Argenna subnigra* (O. P.-Cambridge) (♀ and numerous subadults, of which ♂2♀♀ were subsequently raised to maturity) and **Ozyptila sanctuaria* (O. P.-Cambridge) (♀), as well as **O. pulcher* (♂♀), **E. angulatus* (subadult ♂), **E. thoracica* (subadults), **P. gibbum* (♂2♀♀), **W. antica* (3♀♀), **W. unicornis* (♂), *Baryphyma trifrons* (O. P.-Cambridge) (♂), **G. rubens* (3♀♀), **Oedothorax retusus* (Westring) (♂), **Cnephalocotes obscurus* (Blackwall) (♂), **T. praecox* (2♂♂4♀♀), *S. frontata* (♂♀), *E. atra* (♂2♀♀), *Porrhomma pygmaeum* (Blackwall) (2♀♀), **C. concinna* (♀), *B. gracilis* (8♀♀), *L. tenuis* (♂), **L. ericaeus* (♀), **M. mengei* (♂), **H. nava* (♂), **C. phragmites* (♀), **Clubiona terrestris* Westring (2♂♂4♀♀), **C. diversa* (♂2♀♀), **Clubiona*

subtilis L. Koch (♂♀) and **M. pulicaria* (subadult ♀). A visit on 16 May 2006 revealed the following spiders *E. thoracica* (1♀), **Pocadicnemis pumila* (Blackwall) (♀), *Tiso vagans* (Blackwall) (♀), *E. atra* (♀), **Pardosa monticola* (Clerck) (♂), **P. pullata* (♂), **Alopecosa pulverulenta* (Clerck) (3♀♀), **Trochosa terricola* Thorell (5♀♀), *Arctosa perita* (Latreille) (♂♀), *A. subnigra* (2♂♂, and subadults ♂♀), *C. terrestris* (♀), **Drassodes cupreus* (Blackwall) (♂2♀♀), **Zelotes latreillei* (Simon) (♀), *M. pulicaria* (subadult ♀), *X. cristatus* (2♀♀) and **X. erraticus* (3♀♀).

M. peusi is a rare spider, associated with coastal sites and reported in Ireland from counties Down and Meath (Merrett, 1982). *A. subnigra* is also a rare coastal species, known in Ireland from counties Kerry and Dublin. *O. sanctuaria* has in addition been reported from single sites in counties Waterford, Kilkenny and Cork.

***Evansia merens* O. P.-Cambridge**

LONGFORD: *Corn Hill N1884, 17 August 2005, ♂♀ under a stone on remnant hilltop heath; **WATERFORD**: *Great Newtown Head X5698, 8 June 2005, ♂♀ under stones on coastal heath.

Present in ant colonies in both cases. Although said to have a northern distribution, recent Irish records have come from southern countries. Likely to prove widespread in Ireland on well drained acid soils.

***Saloca diceros* (O. P.-Cambridge)**

CLARE: *Brian Boru's Fort, Killaloe R696742, 8 November 2007, 4♂♂10♀♀ sieved from beech *Fagus sylvatica* L. leaf litter/moss collected in a dry moat surrounding ancient earthworks. Ballyalia R344818, 30 April 2008, 2♀♀ sieved from leaf litter at the base of a wall in hillside *Fagus* woodland. Drumcliff Bridge, R327791 30 April 2008, ♀ sieved from leaf litter collected in disturbed mixed woodland. Other uncommon spiders present were *Tapinocyba insecta* (L. Koch) (♂), *Asthenargus paganus* (Simon) (3♀♀) and *Hahnia helveola* Simon (2♀♀); **GALWAY**: *Furbo, M183231, 2 April 2008, ♂8♀♀ sieved from leaf litter in wet deciduous woodland.

S. diceros is a rare linyphiid spider, generally recorded from wet leaf litter. Reported from

Co. Cork by Merrett (1975), and from counties Limerick and Tipperary by Oxbrough (2007).

***Gongylidiellum latebricola* (O. P.-Cambridge)**

LOUTH: Ardee Bog N9391, 7 May 2008. **G. latebricola* (♀) sieved from *Sphagnum* collected in a raised bog. Other uncommon spiders collected were **R. arundineti* (2♀♀) and **Scotina gracilipes* (Blackwall) (subadult ♀), as well as **E. angulatus* (subadults), *Theridion sisyphium* (Clerck) (2♂♂), **Neottiura bimaculata* (L) (subadults), *Ceratinella brevipes* (Westring) (♀), **D. bifrons*(♂♀), *G. rubens* (2♀♀), *Maso sundevalli* (Westring) (2♀♀), **P. ludicrum* (4♂♂4♀♀), **Kaestneria dorsalis* (Wider) (♂), **L. obscurus* (♂), **T. extensa* (♂2♀♀), *Tetragnatha montana* Simon (♂), *A. diadematus* (subadult), *Larinioides cornutus* (Clerck) (subadult ♂), **Agalenatea redii* (Scopoli) (2♀♀), *P. pullata* (♂), *Pardosa nigriceps* (Thorell) (♀), **Pisaura mirabilis* (Clerck) (subadults), **A. elegans* (subadults), **D. arundinacea* (11♂8♀♀), **C. trivialis* (♀) and **Zora spinimana* (Sundevall) (2♀♀).

***Milleriana inerrans* (O. P.-Cambridge)**

CORK: Bawnlahan W191339, 27 February 2008, ♂ landed on the author's head while walking along a country lane. A distinctive spider and well known aeronaut, otherwise reported in Ireland by Nolan (2002) and Oxbrough (2007).

***Carorita paludosa* Duffey**

MONAGHAN: Drumillard Lake H817214, 13 September 2005. **C. paludosa* (5♂♂11♀♀) sieved from moss collected in a lakeshore marsh on cut over peat. Other uncommon spiders present were *Walckenaeria nodosa* O. P.-Cambridge (5♂♂5♀♀), and **Erigonella ignobilis* (O. P.-Cambridge) (♂2♀♀), as well as **E. thoracica* (♀), *C. brevipes* (♂), **W. unicornis* (4♂♂2♀♀), **Gnathonarium dentatum* (Wider) (14♂♂7♀♀), **O. gibbosus* (♀), **S. elegans* (2♀♀), **Lophomma punctatum* (Blackwall) (♀), *Diplocephalus permixtus* (O. P.-Cambridge) (5♀♀), *E. atra* (♂), *Drepanotylus uncatus* (O. P.-Cambridge) (♂♀), **P. pygmaeum* (♂), **Tallusia experta* (O. P.-Cambridge) (4♀♀), **C. concinna* (♀), *Bathyphantes approximatus* (O. P.-Cambridge) (4♂♂9♀♀), *B. gracilis* (2♂♂), **Kaestneria pullata* (O. P.-Cambridg) (♂), *Microlinyphia impigra* (O. P.-Cambridge) (♀), **Allomengea vidua* (L. Koch) (2♀♀), **T. extensa* (♀), *Pachygnatha clercki* Sundevall (3♂♂♀), **Araneus quadratus* Clerck (♀♀

frequent), *L. cornutus* (2♀♀), *Pardosa amentata* (Clerck) (♀), *P. piraticus* (7♀♀), **A. elegans* (♀), **C. stagnatilis* (3♂♂2♀♀), **C. phragmites* (♂2♀♀), **Tibellus maritimus* (Menge) (♀), and *Ozyptila trux* (Blackwall) (♀).

Although an internationally rare spider, recent finds in counties Down, Leitrim and Sligo (Cawley, 2004; Nelson, 2005) would suggest that *C. paludosa* is quite widespread in Irish wetlands, at least in the north.

***Asthenargus paganus* (Simon)**

CLARE: *Dromore Wood R3587, 10 October 2007, ♂ in moss on boulders in open deciduous woodland; **CORK**: Ward's Bridge W8189, 2 February 2006, 4♂♂3♀♀ sieved from leaf litter/moss in deciduous woodland. Maulanimirish W202492, 20 February 2007, ♂6♀♀ in moss in conifer plantation; **TIPPERARY**: *Corville S154875, 1 February 2007, ♂2♀♀ in ground layer moss in conifer plantation, with **Tapinocyba pallens* (O. P.-Cambridge) (2♂♂2♀♀) also present; **TYRONE**: *Annagh H446490, 4 January 2007, ♀ sieved from ground layer moss in acid copse bordering remnant bog, with **T. pallens* (2♂♂2♀♀) also present.

Although only listed from one and two counties respectively by Helsdingen (1996), both *A. paganus* and especially *T. pallens* would appear to be quite widespread in Ireland.

***Jacksonella falconeri* (Jackson)**

TYRONE: *Annagh H446490, 4 January 2007, subadult ♂ sieved from moss collected in a small area of blanket bog. Raised to maturity in February 2008. Another uncommon spider present was *P. mengei* (♀), and also present were **W. acuminata* (♀), **Minyriolus pusillus* (Wider) (6♀♀), **G. vivum* (2♂♂♀), **D. permixtus* (♂), *E. atra* (♂♀), **C. dilutus* (4♂♂11♀♀), *B. gracilis* (♂♀), **L. alacris* (♀), **Lepthyphantes cristatus* (Menge) (2♀♀) and *S. gracilipes* (subadult ♀).

***Porrhomma pallidum* Jackson**

CORK: *Bawnlahan W188345, 27 February 2008, ♀ sieved from leaf litter in hillside deciduous woodland; **ROSCOMMON**: *Cloonfad M514701, 19 January 2008, ♂ in deep moss clump, under *Betula* at the edge of a blanket bog; **SLIGO**: Keelogyboy G7739, 30 May 2005, ♀ under a stone on a small patch of limestone pavement at *circa* 420m. Other interesting spiders

present on the summit were *M. herbigradus* (♂), *Mecynargus morulus* (O. P.-Cambridge) (♂4♀♀) and **A. olivacea* (2♂♂6♀♀)

***Porrhomma egeria* Simon**

KILDARE: *Moore Abbey Wood N635089, 27 April 2007, ♀ under a stone in *Fagus* woodland.

***Agyneta ramosa* Jackson**

LIMERICK: *Eyon R738508, 4 May 2006, ♀ in ground layer moss in scrub woodland; **WEXFORD**: *Forth Mountain S9919, 27 May 2005, ♀♀ in disturbed heath at *circa* 210m.

A. ramosa was added to the Irish list by Fahy and Gormally (2003).

***Maro minutus* O. P.-Cambridge**

LEITRIM: *Lough Naweelogue G9933, 28 June 2005, ♀ sieved from flooded lakeshore *Sphagnum* at *circa* 420m. Also present on the summit was **M. morulus* (♀) and **Hilaira frigida* (Thorell) (♂).

M. minutus is a minuscule linyphiid, added to the Irish list by Nolan (2000), and also reported by Cawley (2004, 2007) and McCormack *et al*. (2006). It could yet prove widespread in Ireland, especially in the north.

***Centromerus albidus* Simon** **New to Ireland**

GALWAY: Knockmaa M359487, 26 September 2007, ♀ sieved from *Fagus* leaf litter in mixed woodland. Other uncommon spiders present were *T. insecta* (6♀♀), **A. paganus* (6♀♀), and **H. helveola* (♂) as well as *W. acuminata* (♂), *M. fuscipes* (6♀♀), *S. frontata* (♂), *Microneta viaria* (Blackwall) (2♀♀), *C. dilutus* (2♂♂8♀♀), *Saaristoa abnormis* (Blackwall) (♀) and *L. zimmermanni* (♀). A visit on 2 January 2008 failed to turn up any additional *C. albidus* however **Walckenaeria cucullata* (C. L. Koch) (2♀♀) was collected.

C. albidus is an internationally rare linyphiid, associated as at Knockmaa with beech leaf litter. Although widespread in Great Britain, *W. cucullata* is otherwise known in Ireland only from a single female, collected by R. A. Phillips in Borrisokane, Co. Tipperary (Pack-Beresford, 1929).

***Sintula corniger* (Blackwall)**

GALWAY: *Garryland M417034, 26 June 2006, ♀♀ sieved from ground layer moss on a bank in mixed woodland. Other uncommon spiders present in ground layer moss and leaf litter were **Ceratinella brevis* (Wider) (2♂♂3♀♀), **A. paganus* (3♀♀) and **Scotina celans* (Blackwall) (subadults), as well as **Ceratinella scabrosa* (O. P.-Cambridge) (♀), *M. pusillus* (2♂♂2♀♀), *M. fuscipes* (2♀♀), *M. viaria* (2♀♀), *C. dilutus* (♀), *S. abnormis* (subadult), *Pirata hygrophilus* Thorell (♀) and *Neon reticulatus* (Blackwall) (♂). A visit to this site in May 2007 revealed the presence of **Pardosa saltans* Töpfer-Hofmann (♂).

S. corniger is a distinctive spider, and has a scattered distribution in Great Britain. It was added to the Irish list by Johnston and Cameron (2002). *P. saltans* was identified using Töpfer-Hofmann *et al*. (2000). Irish records for *Pardosa lugubris* (Walckenaer) are most likely to refer to this species.

***Pachygnatha listeri* Sundevall**

WESTMEATH: *Crookedwood N464628, 16 May 2008, ♀ collected in mixed deciduous woodland, with **Hylyphantes graminicola* (Sundevall) (♀) present on *Ulex* in adjacent field.

***Larinioides sclopetarius* (Clerck)**

CLARE: *Killaloe R699731, 8 November 2007, in plastic covers over lifebuoys, along the River Shannon; **KILDARE**: *Monasterevin N6210, 20 September 2006, on a metal bridge at the Grand Canal; **LIMERICK**: *Plassey Bridge 608586, 8 September 2006. Frequent on a metal footbridge over the River Shannon; **OFFALY**: *Shannonbridge M267254, April 2008, on a metal crane at the River Shannon; **SLIGO**: *Doorly Park G7035, 18 October 2006, metal railings at the Garavogue River.

Added to the Irish list by Taylor (1986), and with a number of recent records. Clearly widespread, especially on hard structures near rivers.

***Pardosa prativaga* (L. Koch)**

CORK: *Glenbower Wood W9977, 16 May 2004, path through mixed woodland; **WEXFORD**: *Castlebridge T0426, 21 June 2005, relatively common in salt mash, although outnumbered by **Pardosa purbeckensis* F. O. P.-Cambridge; **WICKLOW**: *Ferrybank,

Arklow T257741, 28 May 2005, sandy area bordering marsh.

***Tegenaria parietina* (Fourcroy)**

CORK: Cork Docks W6872, 24 September 2005, ♂ on a factory wall.

***Tegenaria agrestis* (Walckenaer)**

WEXFORD: *Tincone, Wexford T0522, 9 September 2004, ♀ under a stone on waste ground.

A likely immigrant, otherwise known in Ireland from a waste ground site in Cork City (Cawley, 2001).

***Tegenaria silvestris* L. Koch**

CORK: Coolacullig W4574, 19 January 2006, ♀ in moss on *Fagus* trunks at the edge of conifer plantation. Carrigrohane Bridge W618710, 24 February 2007, single male among stacked tiles at the ruins of a building.

Otherwise known in Ireland from a disused quarry in Cork City (Cawley, 2004).

***Nigma puella* (Simon)**

LIMERICK: *Knockfeerina R4436, 4 June 2006, subadult ♀ beaten from bramble *Rubus* sp. on hilltop heath. ***Pocadicnemis juncea* Locket and Millidge (2♂♂) collected from *Sphagnum* in a nearby boggy area.

***Liocranum rupicola* (Walckenaer)**

GALWAY: *Oghil, Inishmore L872089, 28 August 2007, subadult ♀ under a stone on a dry cliff, in an area of limestone pavement. Other uncommon spiders collected were *Cheiracanthium erraticum* (Walckenaer) (subadults), *Drassodes lapidosus* (Walckenaer) (2♀♀) and *Pseudeuophrys erratica* (Walckenaer) (♂♀), as well as *G. rubens* (2♀♀), *Stemonyphantes lineatus* (L.) (subadult ♂), *P. degeeri* (♂), *A. diadematus* (♀), *P. pullata* (3♀♀), *T. terricola* (♂2♀♀), *P. mirabilis* (♀), *C. terrestris* (♀), **Z. latreillei* (♀), *M. pulicaria* (♀), *X. cristatus* (♂), *Heliophanus cupreus* (Walckenaer) (2♀♀) and *Euophrys frontalis* (Walckenaer) (♂2♀♀).

Site comprises a very extensive and diverse area of limestone pavement. Characteristic Burren plants present included *Adiantum capillus-veneris* L., *Juniperus communis* L., *Geranium sanguineum* L. *Rubia peregrina* L. as well as the alien *Mycelis muralis* (L.). *L. rupicola* is otherwise known in Ireland from single sites in counties Dublin (Pack-Beresford, 1911) and

Wexford (Cawley, 2001). Although confused with it in the past, *D. lapidosus* appears to be much scarcer than the widespread *D. cupreus*. A similar situation pertains in Great Britain.

Philodromus dispar Walckenaer

KILKENNY: Fiddown S467198, 16 May 2007. **P. dispar* (♂8♀♀), beaten from *Taxus* in an old graveyard. Another interesting spider present was **Lathys* sp. (♂13♀♀), as well as *Harpactea hombergi* (Scopoli) (immature), **Theridion varians* Hahn (4♂♂7♀♀), *Theridion mystaceum* L. Koch (2♀♀), *H. graminicola* (2♂♂♀), **Hypomma cornutum* (Blackwall) (2♂♂13♀♀), *K. dorsalis* (2♀♀), *Lepthyphantes minutus* (Blackwall) (2♀♀), *T. montana* (♂), **Cyclosa conica* (Pallas) (♀), *C. terrestris* (♀), *C. comta* (2♀♀), *Philodromus aureolus* (Clerck) (3♂♂2♀♀) and **X. cristatus* (♀); **TIPPERARY**: *Ferryhouse S237229, 7 June 2007, 3♀♀ beaten from path verge bushes, along the northern bank of the River Suir. Caher Park Wood S0522, 19 July 2007, 2♀♀ beaten from woodland vegetation along the River Suir.

The identity of the *Lathys* sp., which is close to *humilis* (Blackwall), and similar to specimens collected in Co. Waterford, is currently being investigated.

***Philodromus praedatus* O. P.-Cambridge** **New to Ireland**

CAVAN: Headford Wood Virginia, N5987, 14 June 2006, ♂ beaten from a young *Quercus* in a clearing in mixed woodland. Other spiders beaten from woodland vegetation were **Anelosimus vittatus* (C. L. Koch) (♀), *Paidiscura pallens* (Blackwall) (2♀♀), **Rugathodes instabilis* (O. P.-Cambridge, 1871) (♀), *E. ovata* (3♂♂), **D. bifrons* (2♀♀), *E. atra* (♀), **K. dorsalis* (♂♀), **L. obscurus* (3♂♂), *L. zimmermanni* (3♀♀), *Neriene montana* (Clerck) (2♀♀), **N. clathrata* (♀), **Neriene peltata* (Wider) (2♂♂7♀♀), **T. montana* (6♂♂10♀♀), **M. mengei* (2♂♂2♀♀), *M. merianae* (2♀♀), *Araniella cucurbitina* (Clerck) (2♀♀), *Anyphaena accentuata* (Walckenaer) (subadult) and **C. reclusa* (♀). The following spiders were collected from the ground layer, in moss, leaf litter etc: **C. scabrosa* (♂), *W. acuminata* (subadult ♂), **M. sundevalli* (2♀♀), *M. fuscipes* (4♀♀), **G. vivum* (♀), **Diplocephalus picinus* (Blackwall) (♂), **Agyneta conigera* (O. P.-Cambridge) (4♀♀), **C. dilutus* (2♀♀), **S. abnormis* (♂♀), *P. amentata* (2♀♀), **P. saltans* (11♀♀), **P. hygrophilus* (♂) and **H. helveola* (♀). This site was re-visited on 30 November 2006, and the following spiders collected in leaf litter and in moss on tree trunks: *P.*

pallens (subadult ♂), **P. gibbum* (♂♀), **C. brevipes* (♂♀), *W. acuminata* (subadult ♀), *M. sundevalli* (♀), **Pelecopsis nemoralis* (Blackwall) (♀), *T. pallens* (♂), *M. fuscipes* (2♀♀), **M. castaneipes* (3♀♀), *G. vivum* (♂), *S. frontata* (13♂♂8♀♀), *D. picinus* (♀), **M. viaria* (♂), *C. dilutus* (7♂♂7♀♀), **Saaristoa firma* (O. P.-Cambridge) (2♀♀), **Drapetisca socialis* (Sundevall) (♀), **L. alacris* (♂7♀♀), *L. zimmermanni* (3♀♀), *M. merianae* (♂), **Cryphoeca silvicola* (C. L. Koch) (2♂♂) and **A. accentuata* (subadults); **GALWAY**: Garryland M425028, 26 June 2006, gravid ♀ beaten from *Quercus* at the edge of mixed woodland. Other uncommon spiders beaten beaten from *Quercus*, buckthorn *Rhamnus catharticus* (L.) etc were **H. graminicola* (2♂♂♀), **Tetragnatha nigrita* Lendl (5♂♂♀), *Dictyna uncinata* Thorell (♀) and **N. puella* (♂♀) and also present were **A. vittatus* (♀), *P. pallens* (♂), **R. instabilis* (♀), *E. ovata* (4♂♂♀), **Gongylidium rufipes* (L.) (2♂♂5♀♀), *H. cornutum* (3♀♀), *Erigone dentipalpis* (Wider) (2♂♂), *E. atra* (♂), *K. dorsalis* (♀), *N. peltata* (3♀♀), **T. montana* (6♂♂4♀♀), *M. mengei* (♂2♀♀), *A. cucurbitina* (♂), *A. accentuata* (♀) and **Clubiona lutescens* Westring (♀).

P. praedatus is a critical species, very similar in general appearance and genitalia to the widely recorded *P. aureolus*. Specimens were identified using Kubcová (2004) and Roberts (1985, 1993). *P. praedatus* has proved to be widespread if scarce in Great Britain, usually occurring on *Quercus*. It could yet prove to be widespread in Ireland. *H. gramnicola* and *N. puella* have markedly southern distributions, and are likely to be close to their northern limits in Ireland at Garryland.

***Philodromus albidus* Kulczyński** **New to Ireland**

CORK: Ballyphehane, Cork City W678697, 14 July 2004, ♀ beaten from a self sown bay bush *Laurus nobilis* L. on waste ground. Initially misidentified as *P. dispar*, however a re-examination in 2006 allowed the specimen to be easily determined as *albidus* using Roberts (1993); **GALWAY**: Coole-Garryland complex M4103, 29 April 2007, 3♂♂♀ beaten from *Quercus*, with **P. dispar* (2♂♂♀) also present.

P. albidus is a scarce spider with a southern distribution in Britain, where until recently it was confused with the very similar *Philodromus rufus* Walckenaer. Recent information, e.g.

from Askins (2005), suggests that this spider is on the increase in that country.

***Diaea dorsata* (Fabricius)**

WEXFORD: *Camlin Hill S715255, 3 July 2008. Subadults beaten from vegetation in mixed woodland.

Otherwise known in Ireland only from Killarney National Park, Co. Kerry (Cawley, 2001).

***Xysticus ulmi* (Hahn)**

TIPPERARY: *Monaincha S189874, 4 May 2007, mature ♂ beaten from gorse *Ulex europaeus* L. at the edge of a raised bog.

***Ozyptila praticola* (C. L. Koch)**

TIPPERARY: Caher S051254, 20 September 2007, subadult ♀ sieved from ground layer moss, collected in open carr woodland.

Although recorded from five counties by Helsdingen (1996), *O. praticola* seems to be quite a scarce spider in Ireland, and I am not aware of any other recent record.

***Pseudeuophrys lanigera* (Simon)**

LAOIS: *Portlaoise S4798, 12 September 2005, ♂ active on a house wall in town centre.

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DISTRIBUTION RECORDS FOR UNCOMMON ANTS INCLUDING *STENAMMA DEBILE* (FOERSTER) (HYMENOPTERA: FORMICIDAE) NEW TO IRELAND

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Introduction

Ireland's rather impoverished ant fauna has been reviewed by Stelfox (1927), however relatively little new information has been added over recent years. A number of additions have been made to the ant fauna of Great Britain, many of which are difficult to separate from previously well known species, and a comprehensive key in English is currently unavailable. One of these critical species, *Lasius platythorax* Seifert has recently been reported from Ireland by Alexander and Orledge (2006), with additional records being provided by Lush (2007). Ronayne and O'Connor (2006) list 19 ant species as Irish, however this total does not include a number of alien 'tramp species', generally restricted to heated buildings. Over recent years the author has gathered a number of records for some of the more interesting, and distinctive species, and these are detailed below. Excepting *Stenamma*, specimens were identified using Bolton and Collingwood (1975).

Hypoponera punctatissima (Roger)

TIPPERARY: Ferryhouse, Clonmel S237229, 25 October 2000. Frequent in a large heap of leaves, which was obviously of long standing and acting as a compost heap, on a neglected patch of ground between the River Suir and St Joseph's Church. Other interesting invertebrates present have been reported elsewhere (e.g. Cawley, 2005). *H. punctatissima* was found to be absent when the site was revisited on 7 June 2007, however the nature of the compost heap had changed considerably in the intervening years. The composting vegetation was found to comprise mostly of grass cuttings, unlike in 2000 when dry leaves predominated. Also in 2007 the site was rather more shaded than in 2000, with few invertebrates present excepting an

abundance of the local woodlouse *Porcellionides pruinosus* (Brandt), a species entirely absent in 2000. A nearby cider brewing facility and associated orchard is presumably the source of this colony; **CORK**: Oliver Plunkett Street, Cork City W675717, 3 August 2007. Single male on the inside window of the Bodhran public house. A small number of active specimens located here on 9 August 2007, with nest seemingly established inside wooden panelling at the base of the window. A fair number of individuals swarming here in July 2008. The Bodhran is typical of many public houses in Cork City, and indeed throughout the country, and is not unduly heated.

H. punctatissima is a distinctive, if inconspicuous, alien ant, which in Britain is generally restricted to heated buildings, although very occasionally colonies are found outdoors. Previous Irish records have concerned the discovery of a singleton in Dublin (Stelfox, 1942), and indoor colonies in Belfast and Dublin (Nash and O'Connor, 1990). No doubt there is potential for outdoor colonies in the milder parts of Ireland, especially where artificial heat is available, for example in compost heaps and refuse tips. Certainly the Bodhran record suggests that there is very considerable potential for indoor colonies in urban areas in the milder parts of the country.

***Lasius fuliginosus* (Latreille)**

CORK: Barleycove V768258, 8 May 1996, a few workers under a stone in sand dunes. Inchydoney W4038, 23 July 2000, workers in moss on a damp patch in sand dunes. Ballinglanna W441383, 10 June 2008, frequent on a low sea cliff, and the largest population seen by the author. The species was attending aphids which were infesting rock samphire *Crithmum maritimum* L.; **GALWAY**: present at the following sites on Inishmore in the Aran Islands: Pollheely L851110, 19 July 1996, under stones at the base of a stone wall. Ballynacragga L853107, 20 July 1996, frequent on a low limestone cliff, and rediscovered there in August 2007. Oghil Lough L894108, 28 August 2007, under stones at the base of a stone wall. Dog's Head L9007, 29 August 2007, a few workers located in sand dunes. Clearly widespread on Inishmore. The species most certainly remains to be discovered in the Burren region of Co. Clare.

This large and distinctive ant would appear to be widespread but very local and restricted to the southern half of Ireland. Mapped by Edwards (1997), excluding a Co. Cork record contained

in Walls (1966). Reported from Co. Wexford by Ronayne and O'Connor (2006).

***Myrmica sabuleti* Meinert**

CORK: Baile Iarthach, Cape Clear Island V9520, 18 August 1996, roadside bank. Blananarragaun, Cape Clear Island V9419, 19 August 1996, coastal heath. Ballycotton W9963, 6 March 1998, coastal heath. The Beacon, Baltimore W038254, 6 July 2007, coastal heath; **GALWAY**: Knockmaa M359484, 26 September 2007, in moss on limestone pavement; **WEXFORD**: Ladys Island T1003, 25 October 1994, sand dunes.

It would be very easy to overlook this non-descript ant among the abundance of *Myrmica* spp. Recently reported from Counties Dublin and Louth by Ronayne and O'Connor (2006).

***Leptothorax acervorum* (Fabricius)**

CORK: Trawlebane W028480, 18 April 1996, under a stone on an acid hillside; **GALWAY**: Castlequarter M425022, 26 June 2006, scattered individuals present on limestone pavement. Oghil, Inishmore, L872089, 28 August 2007, scattered on a large area of limestone pavement. Rossaveel Hill L958247, 19 February 2008, coastal heath; **KERRY**: Killarney National Park V9686, 23 August 2001, active on a log in open scrub woodland along the lakeshore; **SLIGO**: Bunduff G7055, 12 May 1993, under loose bark on a rotting tree stump, in a conifer plantation on sand dunes. Keelogyboy G7739, 30 May 2005, single worker in moss on the mountain summit at *circa* 420m; **WATERFORD**: Treenearla Common S2702, 14 September 2003. On an exposed rock face in upland heath, at *circa* 350m.

The British Isles distribution of *T. acervorum* is mapped in Edwards (1998) who plots this ant as occurring in 45 widely scattered 10km squares in Ireland, of which only one is post 1970. A number of additional records are included in Ronayne and O'Connor (2006). The above new records suggest that this ant is widespread in Ireland, however it is distinctly local and almost invariably found in small numbers.

***Tetramorium caespitum* (L.)**

CORK: Barley Cove V770248, 8 May 1996, heathy hillside. Dunlough Bay V7326, 9 May 1996, coastal erosion bank. Baile Iarthach, Clear Island V9520, 18 August 1996, grassy bank. Blananarragaun, Clear Island V9419, 19 August 1996, coastal heath. Roberts Head W7853, 17

May 1998, frequent under mats of thrift *Armeria maritima* L. on a coastal headland. Garrettstown W591433, 7 July 1998, under mats of *A. maritima* on a dry bank. Myrtleville W7959, 25 April 2001, sea cliff. The Beacon, Baltimore W038254, 6 July 2007, a few nests found on coastal heath; **WATERFORD**: Templeyvrick X4298, 4 May 1998, frequent under stones on a dry coastal bank. Stradbally Cove X3796, 23 March 2000, in rock fissures on a sea cliff. Great Newtown Head X5799, 8 June 2005, single nest found on a patch of coastal heath; **WEXFORD**: Ballyteige Burrow S9306, 15 September 1996, sand dunes.

This distinctive little ant appears to have a strictly coastal distribution in Ireland, with colonies often confined to within a few metres of the splash zone. In my experience, it has a preference for exposed rocky sites and avoids estuarine conditions. The British Isles distribution of *T. caespitum* has been mapped by Edwards and Telfer (2001), who plot the species as occurring in just 14 Irish 10km squares, all along the south coast, excepting one Co. Dublin record. However a number of records from Cork and Waterford listed by Walls (1966) are not included on this map.

***Stenamma debile* (Foerster)** **New to Ireland**

CORK: Ballincollig Regional Park W5871, 29 May 1995, a worker under a stone at the base of an old wall in open disturbed scrub, with a second worker located here in February 2007. Carrigaline W732626, 21 April 2004, a single worker under an embedded rock on limestone outcrop in the town park; **WATERFORD**: Bawnatanovoher X247940, 21 February 2003, a single worker sieved from moss collected on a roadside bank. The identity of this specimen, and individuals from Ballincollig and Carragaline, was confirmed by Dr Glenda Orledge; **WEXFORD**: Ballina T113315, 10 October 1994, sieved from debris collected in a cowshed. Macmurroughs S730298, 6 June 2008, a few workers and a queen collected from a nest, under a stone in a patch of planted pine *Pinus*/beech *Fagus* woodland, with an additional worker located in a nearby hedgerow. Kellys Wood, Camlin Hill S711255, 12 June 2008. A single nest eventually located under a stone in a mainly *Fagus* area of mixed woodland, with a forageing worker also sieved from leaf litter. Nests of *Stenamma* were first reported in the British Isles by Phillips (1921) from Mountgarrett, and Camlin Hill, Co Wexford. The Macmurroughs site must

be close to the Phillips' Mountgarrett locality and presumably the Kellys Wood site is identical. These recent finds confirm the continued presence of *Stenamma* in the New Ross area, and that *debile* rather than *westwoodi* is involved.

Irish records for *Stenamma westwoodi* Westwood, summarised by Stelfox (1927), as well as an additional record reported by O'Rourke (1946) are likely to refer to this species. This ant would appear to be widespread but quite local along the south coast, with records now coming from Counties Carlow, Dublin, Kerry, Kilkenny, Tipperary and Wicklow, in addition to the above. Although very distinctive under the microscope, in general appearance it resembles *Myrmica* spp., and as it usually turns up as singletons it could easily be overlooked. A critical species, very similar to *S. westwoodi*, and identified using Skinner and Allen (1996) and Seifert (1996).

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ON THE ARRIVAL IN IRELAND OF *SPHEGINA SIBIRICA* STACKELEBERG, 1953 (DIPTERA: SYRPHIDAE)

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Introduction

Sphegina sibirica Stackelberg, 1953 is a hoverfly associated with spruce forests. it was first described from the Russian far east, but subsequently found scattered through Siberia into European parts of Russia. By 1982 (Peck, 1988) it had also been recorded from Finland and Norway and during the last decades of the 20th century it spread rapidly through western Europe, establishing itself in the ever more numerous spruce plantations. It also became frequent in the spruce forests of the Alps. The first record for France was in 1984 (Speight, 1984), the first record for Britain in 1994 (Stubbs, 1994), when it was reported from Scotland. In Britain, it became known from both Wales and England by 2000 (Ball and Morris, 2000). In 2004, the arrival of this species in Ireland was predicted as "imminent" (Speight, 2004). A casual, Sunday morning visit to one of the mature conifer plantations closest to Dublin, in July, 2008, resulted in observation of *S. sibirica* flying in large numbers round a stand of hogweed *Heracleum sphondylium* L. in flower, at the edge of a trackside in a conifer plantation badly damaged by winter storms. An attempt, two days later, to find the females at the same location showed males still present but no females were found. On this second occasion males were also observed in numbers, visiting flowers of elder *Sambucus* in partial shade, alongside the same track. Details of the record are as follows:-

DUBLIN: Ticknock O1624 (PV4), 13-15 July 2008, males hovering around and feeding on flowers of *Heracleum sphondylium* and *Sambucus*, trackside, adjacent to piled logs of *Picea* and *Pinus*, conifer plantation with many large, fallen trees, coll. and det. MCDS; specimens in NMI, Dublin.

Until now there have been only two *Sphegina* species known from Ireland, *S. clunipes*

(Fallén) and *S. elegans* Schummel. *S. sibirica* is easily distinguished from these two species. In *S. sibirica* the second abdominal sternite is unsclerotised and apparently missing and there are large areas of the thoracic pleura that are black, shining and undusted. In both *S. clunipes* and *S. elegans* the second abdominal sternite is well-developed and obviously sclerotised and the thoracic pleura are almost entirely dull, due to a covering of grey polinosity. In Britain, an additional species, *S. verecunda* Collin, occurs. It has the second abdominal sternite well-developed and sclerotised and the pleura are dull. A key to the adults of the western European *Sphegina* species, including *S. sibirica,* is provided by van Veen(2004).

A species account for *Sphegina sibirica* is provided by Speight (2008). The developmental stages of this hoverfly are not described, but like various other *Sphegina* species, the larvae are very probably saproxylic, in this case occurring in sap-runs and under the bark of recently dead or dying *Picea*, in association with decaying sap and fungi. The female has been observed laying eggs on the underside of a recently cut *Picea* log, close to where the log was part-immersed in a small stream. The adult insect occurs on flowers of umbels and other herb layer plants (*Potentilla*, *Ranunculus*), shrubs (*Sambucus*, *Viburnum*) and small trees (*Crataegus*, *Sorbus aucuparia*), close to stands of mature *Picea*.

It has been argued that the poor syrphid fauna associated with conifers in Ireland is due to the absence of native conifers (except *Juniperus* and *Taxus*) for hundreds of years before their re-introduction recently by man (Speight, 2004). It has also been observed (Speight, 2004) that conifer-associated syrphids seem to now be arriving in Ireland and establishing themselves, the two most recent examples being *Eriozona syrphoides* (Fallén) (see Speight, 1998) and *Lapposyrphus lapponicus* (Zetterstedt) (see Gittings, 2006). It would seem reasonable to regard *S. sibirica* as another member of this recently-arrived group of conifer syrphids: in the extensive Malaise-trapping programme of the "Bioforest" project (see Gittings *et al*, 2006), carried out during 2001-3 in conifer plantations in many parts of Ireland, *S. sibirica* was not found among the syrphids collected (T.Gittings, pers.comm.). It can also be said that the Co.Dublin site from which *S. sibirica* has now been collected has been visited each year for more than 30 years, for purposes of syrphid collecting, and had the species been there throughout this period it should

have been come across before now.

The strictly conifer-associated syrphids known from Ireland are nearly all of them aphid-feeding as larvae. Only *Xylota jakutorum* Bagatshanova is a saproxylic, living in the decaying wood of conifer stumps inhabited by the weevil *Hylobius*. Known larvae of *Sphegina* species are also primarily saproxylic, living in association with decaying sap and fungi in sap-runs etc, on the trunks of overmature trees, though mechanical damage can cause the presence of appropriate larval microhabitat on otherwise healthy, mature trees. Storm-felled healthy trees can provide similar opportunities, albeit for only a year or two after they have been brought down. Tom Gittings (pers.comm.) has commented that "habitat conditions are probably just becoming right for *S. sibirica*, as the major spruce plantings began in the 1950s-1960s and are harvested after 40 years. Once the spruce has been harvested, there should be plenty of habitat for it, in the form of the "waste" timber that is normally left (i.e., the odd bits that were too awkward to handle or just got forgotten)". If *S. sibirica* can occur in association with young conifers this has not been observed – and *S. sibirica* is now frequent in central Europe, in particular. Certainly, wind-blow of mature trees would be more likely to provide appropriate larval microhabitat than wind-blow of young trees and, as Tom Gittings notes, mature spruce are now much more frequent in the Irish landscape than they were even 25 years ago. At its Ticknock location, *S. sibirica* appeared suddenly, in great numbers, following extensive wind-felling of mature spruce. A number of the trunks had been left where they fell and 1-2m high stumps, still attached to their root-plate, were everywhere, lying where they had keeled over.

The only unusual feature of the Irish record of *S. sibirica* is that it is from mid- July, and only males were collected, suggesting this was the beginning of the flight period for the species at that locality. The flight period of *S. sibirica* is May/June in the spruce forests of continental Europe and it would not be expected in July other than in Northern Europe, or at higher altitude. However, Ball *et al.* (2002) give June/July as the flight period of this species in Britain. Now that *S. sibirica* has reached Ireland further records can be expected from other parts of the island - there is no reason to suppose its distribution in Ireland might be restricted to Dublin/Wicklow.

Usually *S. sibirica* is collected in the company of other *Sphegina* species, including the most

common Irish *Sphegina*, *S. clunipes*. Interestingly, *S .sibirica* is the only *Sphegina* species that has been found at the Ticknock locality. The full list of syrphids found there is given in the Appendix to this note. Some of the records have already been published, but this is the only time the complete syrphid list for this locality has been presented. Records are derived both from the conifer plantation and its surround, where moorland and acidic, unimproved, moorland grassland are present.

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APPENDIX. Species of Syrphidae collected from Ticknock Wood and its environs (all grid reference O1624), in the period 1972-2008.

Cheilosia albitarsis (Meigen, 1822)
Cheilosia bergenstammi Becker, 1894
Cheilosia illustrata (Harris, 1780)
Cheilosia pagana (Meigen, 1822)
Cheilosia semifasciata Becker, 1894
Chrysogaster solstitialis (Fallén, 1817)
Chrysotoxum fasciatum (Muller, 1764)
Dasysyrphus albostriatus (Fallén, 1817)
Dasysyrphus pinastri (DeGeer, 1776) *sensu* Doczkal, 1996
Dasysyrphus tricinctus (Fallén, 1817)
Dasysyrphus venustus (Meigen, 1822)
Didea fasciata Macquart, 1834
Epistrophe grossulariae (Meigen, 1822)
Episyrphus balteatus (DeGeer, 1776)
Eriozona syrphoides (Fallén, 1817)
Eristalis arbustorum (L., 1758)
Eristalis horticola (De Geer, 1776)
Eristalis intricaria (L., 1758)
Eristalis pertinax (Scopoli, 1763)
Eristalis tenax (L., 1758)
Eupeodes luniger (Meigen, 1822)
Ferdinandea cuprea (Scopoli, 1763)
Helophilus pendulus (L., 1758)
Leucozona glaucia (L., 1758)
Leucozona lucorum (L., 1758)
Megasyrphus erraticus (L., 1758)
Melangyna arctica (Zetterstedt, 1838)
Melangyna lasiophthalma (Zetterstedt, 1843)
Melanogaster hirtella (Loew, 1843)
Melanostoma mellinum (L., 1758)
Melanostoma scalare (Fabricius, 1794)
Meliscaeva auricollis (Meigen, 1822)
Meliscaeva cinctella (Zetterstedt, 1843)
Myathropa florea (L., 1758)
Parasyrphus malinellus (Collin, 1952)
Parasyrphus punctulatus (Verrall, 1873)
Platycheirus albimanus (Fabricius, 1781)
Platycheirus angustatus (Zetterstedt, 1843)
Platycheirus clypeatus (Meigen, 1822)
Platycheirus granditarsus (Forster, 1771)
Platycheirus manicatus (Meigen, 1822)
Platycheirus scutatus (Meigen, 1822)
Platycheirus sticticus (Meigen, 1822)
Rhingia campestris Meigen, 1822
Scaeva pyrastri (L., 1758)

APPENDIX (Continued)

Sericomyia lappona (L.,1758)

Sericomyia silentis (Harris, 1776)

Sphaerophoria fatarum Goeldlin, 1989

Sphaerophoria interrupta (Fabricius, 1805)

Sphaerophoria philantha (Meigen, 1822)

Sphaerophoris scripta (L., 1758)

Sphegina sibirica Stackelberg, 1953

Syritta pipiens (L., 1758)

Syrphus ribesii (L., 1758)

Syrphus torvus Osten-Sacken, 1875

Syrphus vitripennis Meigen, 1822

Volucella pellucens (L., 1758)

Xylota jakutorum Bagatshanova, 1980

Xylota segnis (L., 1758)

IRISH SPIDERS (ARACHNIDA: ARANEAE) COLLECTED DURING A FIVE-YEAR, ISLAND-WIDE STUDY INCLUDING 696 NEW COUNTY RECORDS

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Summary

This paper presents new county records from one of the largest studies of Irish spiders to date. Habitats surveyed included peatlands, grasslands and plantation forests of various ages and tree species. Pitfall traps were used to sample spiders and specimens were also identified from Malaise traps and a DVac Suction sampler in a subset of sites. Over half of the known Irish spider species were sampled (219 species) and 696 new county records are presented. Many of the species with new county records were associated with forested habitats indicating the lack of previous research in this habitat type. It is recommended that spider sampling should continue in a variety of habitat types across a wide geographical range if a full Irish species distribution is to be realised.

Introduction

The study of Irish spiders has largely been limited to small-scale surveys that have focused on the records of individual species (for instance see Mackie, 1963; Finlay, 1966; Wanless, 1965). In more recent years, several authors have made significant additions to the Irish species' list and contributed much needed information on spider ecology and species' distributions. Particular consideration has been given to the spider fauna of Irish bogs and fens (e.g. Higgins, 1985; Helsdingen, 1997, 1998; Nolan, 2002a) which probably reflects the relative importance of this habitat in a national and international context. The publication of van Helsdingen's (1996a) *County distribution of Irish spiders* was the first attempt to collate all known Irish records and to create systematic species lists for each county. Such 'baseline' information is vital if we are to gain a true understanding of the distribution and ecology of Irish spiders.

Large-scale biodiversity studies are necessary in order to help determine the broader ecological associations of a species. Such studies will help establish the Irish spider fauna in an international context and ensure that this important terrestrial group is not overlooked in management and conservation schemes. Although 'open' habitats such as bogs and fens, and grasslands and heathlands have received some attention (see above and also Gibson, 1984 and McFerran *et al*., 1994), relatively little research has focused on Irish forested habitats which represent approximately 10% of the country's land cover (Forest Service, 2004). Plantations constitute over 93% of this forest cover (Teagasc: Irish Agriculture and Food Development Authority, 2005) compared to ~1% accounted for by native woodlands (Department of Agriculture and Food, 2003). The species distributions presented in this paper represent the largest single study of Irish spiders to have been carried out from a range of habitats which included peatlands, grasslands and also plantation forest of various ages and tree species. The data was collected as part of the BIOFOREST project (http//www.ucc.ie/bioforest/) which aimed to examine the affect of afforestation on Irish flora and fauna using various taxonomic groups (ground-dwelling plants, canopy epiphytes, birds, spiders and hoverflies) as indicators of biodiversity (for project reports see Smith *et al*., 2005, 2006; Iremonger *et al*., 2006a, b).

Survey design

In total, 102 sites in 21 counties were surveyed over five years (for site details see Appendix 1) and were comprised of three distinct sub-projects:-

1. The survey of sites typically used during afforestation (sub-project 3.1.1) encompassed three major Irish habitat types (peatlands, wet grasslands and improved grasslands). A paired-site approach was used where 25 sites across the three habitat types were sampled with adjacent 'paired' stands of five-year old Sitka spruce (*Picea sitchensis*) matched for soil type, altitude, and pre-planting habitat type. Sample plots within these sites were located in areas that may be of specific biodiversity value, such as wet flushes, riparian areas and hedgerows as well as areas representative of the site as a whole.

2. The survey of plantation forests at various stages of the forest cycle (sub-project 3.1.2) examined 32 sites in Sitka spruce plantations in the following age groups: 5 years (pre-canopy closure), 8-15 years (canopy closure); 20-30 years (time of the first thinning) and 35-50 years (commercial maturity). Ash (*Fraxinus excelsior*) was surveyed in three age groups: 5 years, 8-15 years and 50+ years, and non-intimately mixed sites of Sitka spruce and ash in the following age groups: 5 years, 8-15 years and 35-50 years. Sampling areas within these sites were located in areas of homogenous vegetation typical of the site as a whole.
3. The survey of open space within mature Sitka spruce plantations (sub-project 3.1.3) sampled 12 sites that contained various types of open space (forestry road edges, rides and glades). In addition to these sites, eight 'experimental road width' sites were surveyed. These comprised recently felled stands which had been re-planted with Sitka spruce. Within each site, a 100m section of forest road was established with a 'wide buffer zone' of 30m width, adjacent to this a 100m section was also established with a 'standard' buffer of 15m. These buffer zones were defined as the distance from the first tree row (base of tree) spanning the forest road, thus giving differing areas of unplanted ground at the forest road edge. With the exception of the experimental road-width sites all of the stands surveyed were first rotation.

Methods

Field surveys were carried out during the summers of 2001-2005. Spiders were sampled primarily using pitfall traps, however in a subset of sites spiders were also identified from Malaise traps and a DVac vortex suction sampler situated in areas adjacent to pitfall traps. Pitfall traps consisted of plastic cups (7cm diameter by 9cm depth) filled to 1cm depth with ethylene glycol and with two drainage slits cut 1cm from the rim of the cup. A bulb corer was used to make a hole in the ground for the plastic cup, which was placed so that the rim of the cup was flush with the ground's surface. The suction sampler was used for five minutes in a 2x2m area. All sampling took place between 10th May and 18th August with pitfall and Malaise traps changed once every three weeks. Various environmental and habitat variables were recorded at each sampling plot (i.e. cover abundance of vegetation layers, litter cover and depth, deadwood cover and soil organic

content).

Pitfall traps were located in sampling plots (between 5-6 plots per site) that were separated by a minimum of 50m and were a minimum of 50m from the edge of the site. In each plot, the traps were arranged in a 4x4m grid with one trap set at each corner and one in the centre, though which linear features were sampled (i.e. riparian areas, hedgerows). The traps were arranged in a line, each one separated by 2m. For surveys of open space within mature plantations (sub-project 3.1.3), traps were set in three transects which were arranged from the centre of the open space into the forest, and each transect being separated by 2m.

Pitfall samples were stored in 70% alcohol and the spiders were sorted from the catch. Identification of spiders to species level was carried out using a 50x magnification microscope and nomenclature follows Roberts (1993). Juveniles were not identified due to the difficulty involved in assigning them to species and published records were used to establish new county records (Helsdingen, 1996a, b, 1998; McFerran, 1997; Smith and Costello, 1998; Snazell and Jonsson, 1999; Merrett, 2000; Nolan, 2000a, b, 2002a, b, 2004; Cawley, 2001, 2004, 2007; Johnston and Cameron, 2002; Fahy and Gormally, 2003; Nelson, 2005; McCormack, 2006; Oxbrough, 2007). Reference specimens are held in the museum collection at University College Cork and can be obtained from the author. All specimens were identified by the author and confirmations of difficult specimens were made by Bob Johnston and Peter Merrett. The author is currently involved in analysing the habitat associations of the species surveyed in this project and these data will be presented in a separate paper.

Results

Over half of the known Irish spider fauna was found during the study with one new Irish species and several rare species (reported in Oxbrough, 2007 and the present study). In total 65,063 mature adults were identified representing 219 species from 17 families. Of these species, 79% had new county records (NCRs) identified, a full list of which is given in Appendix 2.

Distribution of new county records

Overall, by far the most NCRs were identified in Counties Laois and Limerick (Table 1), whereas County Fermanagh had the lowest number of NCRs. Across the counties there was a disproportionate number of sites surveyed and examination of the mean NCRs per site within each county reveals that despite 10 or more sites being surveyed in Counties Cork, Laois, Tipperary and Wicklow, there are relatively few NCRs per site. By contrast, in Counties Dublin, Kildare and Leitrim where only 1 or 2 sites where surveyed, there were over 20 NCRs identified per site.

TABLE 1. The frequency of new county records (NCRs) identified within each county.

County (code)	Total NCRs per county	Total sites surveyed per county	Mean NCRs per site
Limerick (LIM)	85	8	10.6
Laois (LAO)	57	11	5.2
Waterford (WAT)	49	4	12.3
Wicklow (WIC)	46	10	4.6
Kilkenny (KLK)	45	5	9.0
Tipperary (TIP)	45	11	4.1
Leitrim (LEI)	41	2	20.5
Kerry (KER)	41	9	4.6
Cork (COR)	37	13	2.8
Donegal (DON)	33	4	8.3
Mayo (MAY)	33	2	16.5
Galway (GAL)	32	5	6.4
Dublin (DUB)	24	1	24.0
Clare (CLA)	23	6	3.8
Kildare (KLD)	21	1	21.0
Westmeath (WES)	19	1	19.0
Offaly (OFF)	17	2	8.5
Sligo (SLI)	16	1	16.0
Carlow (CAR)	14	1	14.0
Wexford (WEX)	13	2	6.5
Fermanagh (FER)	8	2	4.0

The species with multiple new county records are shown in Table 2 and comprise 30% of all NCRs. The most new county records were identified for the following species: *Lepthyphantes tenebricola, Micrargus herbigradus, Pocadicnemis juncea* and *Agyneta*

ramosa. The majority of these species' NCRs were from plantation forest habitats, however several species were found in a relatively high number of wet grassland sites within each county such as *Trochosa spinipalpis* and *P. juncea*.

TABLE 2. Species with the most NCRs.

Species	NCRs
Lepthyphantes tenebricola	16
Pocadicnemis juncea	16
Micrargus herbigradus	15
Agyneta ramosa	14
Dicymbium tibiale	13
Walckenaeria vigilax	12
Lepthyphantes alacris	11
Asthenargus paganus	11
Ceratinella scabrosa	11
Maro minutus	11
Trochosa spinipalpis	11
Taranucnus setosus	10
Bathyphantes parvulus	10
Diplocephalus latifrons	10
Pirata ulignosus	10
Saaristoa abnormis	10
Saaristoa firma	10
Agyneta decora	9

Discussion

Overall, it should be expected that more new county records will be identified in counties where a greater number of sites were surveyed. However as Table 1 shows, this was not always the case. The high number of new county records presented is likely to be a factor of both the large-scale nature of the study (102 sites across 21 counties) and the range of habitats sampled, as well as the pattern in the recording of historical and recent records.

Several rare species were collected during the study (see Oxbrough, 2007), however it is likely that many of the new county records presented here are due to a lack of past recording rather than actual species' rarity. For example, *A. ramosa* has only recently been added to the Irish list (Fahy and Gormally, 2003); whereas *L. tenebricola* has only been

found in three Irish counties prior to this study, however both are known to be widespread across Britain (Harvey *et al*., 2002). It is likely that these species' preference for forested habitats explains the few records to date. Indeed, several other species with a high number of new county records are associated with forested habitats such as *A. paganus* and *C. scabrosa* (Harvey *et al*., 2002). In Britain, both species have rather local and rare distributions (Harvey *et al*., 2002) highlighting the need for further exploration in Irish forested habitats. The geographical distribution of the new county records may reflect the distribution of Irish plantation forests of which there are many in Counties Laois, Limerick, Tipperary and Wicklow and towards which our sampling was directed. However this can also be attributed to a 'sampler bias' effect related to where arachnologists live or particular habitats which are interest to them. In County Dublin, where one might expect the spider fauna to be relatively well known there were 24 new county records identified from just one mature plantation site. However this probably represents the lack of sampling carried out in forested habitats in this county.

Difficulty with species identification and changes in taxonomic classification may also give a 'false' impression of species rarity. For example, *Pocadicnemis juncea*, with 16 new county records in the present study, was only relatively recently described as a separate species from *P. pumila* (Millidge, 1975) and difficulty can be encountered when distinguishing female specimens which may further distort records.

Although recent studies have greatly improved our knowledge of Irish spiders, it is still vital to continue collecting baseline distribution information. In addition, sampling spiders in a variety of habitat types using a wide range of sampling techniques will further enhance our knowledge of their ecology.

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APPENDIX 1. Study site locations and corresponding habitat types; the sampling method used is also given: P = pitfalls; S = Vortex suction sampler; M = Malaise trap. Further site details including soil and vegetation information can be obtained from the aforementioned project reports. 'Planted' refers to a 5 year old Sitka spruce plantation established on a particular habitat type; OS = Open space; SS = Sitka spruce

Site code	Site name	Grid Ref	County	Habitat	Sampling method
Sub-project 3.1.1					
Agho	Aghoney	S547875	Laois	Improved grassland	P
Balb	Ballybeagh	S349560	Kilkenny	Planted improved grassland	P, S, M
Balp	Ballynanoose	R820686	Tipperary	Planted improved grassland	P
Balu	Ballynanoose	R823684	Tipperary	Improved grassland	P
Bght	Ballybought	N314325	Offaly	Improved grassland	P
Bool	Boolavaun	R227820	Clare	Wet grassland	P
Carp	Carnamoyle	C430294	Donegal	Planted peatland	P
Caru	Carnamoyle	C434291	Donegal	Peatland	P
Cast	Castletown	S279752	Kilkenny	Improved grassland	P
Clar	Clarbarracum	S508862	Laois	Wet grassland	P
Clop	Cloonoughter	R146464	Limerick	Planted wet grassland	P
Clou	Cloonoughter	R148466	Limerick	Wet grassland	P
Cooa	Coolross	R722649	Tipperary	Planted wet grassland	P, S, M
Coog	Coolsnaghtig	W210559	Cork	Wet grassland	P
Curr	Curraghnaboul	R723482	Limerick	Wet grassland	P
Dong	Donaghmore	S266798	Laois	Wet grassland	P
Doon	Doon	R978063	Tipperary	Improved grassland	P
Flem	Flemingstown	R183064	Tipperary	Improved grassland	P
Garv	Garvoghil	R230820	Clare	Wet grassland	P
Gary	Garyandrew	S108354	Tipperary	Improved grassland	P

Geap	Gearha	V784729	Kerry	Planted wet grassland	P
Geau	Gearha	V781725	Kerry	Peatland	P
Glas	Garryglas	S508868	Laois	Planted wet grassland	P
Glen	Glenfield North	R441147	Cork	Planted wet grassland	P
Gore	Gortnaree	H187721	Fermanagh	Planted wet grassland	P, S, M
Hanp	Ballycahan	N310325	Westmeath	Planted improved grassland	P
Incp	Inchamore	R572993	Galway	Planted wet grassland	P, S, M
Incu	Inchamore	R577997	Galway	Peatland	P, S, M
Kilb	Kilbraugh	S295551	Tipperary	Improved grassland	P, S, M
Kill	Kilcullen	S623410	Kilkenny	Improved grassland	P
Knaw	Knawhill	R440148	Cork	Wet grassland	P
Lead	Knocklead	S548861	Laois	Planted improved grassland	P
Mntp	Mountphillips	R721648	Tipperary	Wet grassland	P
Moaf	Moanfune	W987925	Waterford	Improved grassland	P, S, M
Moig	Moigh	R720484	Limerick	Wet grassland	P
Mull	Mullanmeen Under	H162712	Fermanagh	Wet grassland	P, S, M
Muny	Mungmacody	S625415	Kilkenny	Planted improved grassland	P
Ratr	Rathreagh	S281725	Kilkenny	Planted improved grassland	P
Raup	Curraun	H102005	Leitrim	Planted wet grassland	P
Rauu	Curraun	H102004	Leitrim	Wet grassland	P
Slip	Slievecorragh	N969045	Wicklow	Planted peatland	P, S, M
Sliu	Slievecorragh	N972046	Wicklow	Peatland	P, S, M
Tiep	Tieveclougher	H124884	Donegal	Planted wet grassland	P
Tieu	Tieveclougher	H124883	Donegal	Peatland	P
Togp	Toreenagowan	R821146	Kerry	Planted wet grassland	P, S, M
Togu	Toreenagowan	R840152	Kerry	Peatland	P, S, M
Toop	Toreenmore	V523766	Kerry	Planted wet grassland	P, S, M
Toou	Toreenmore	V519766	Kerry	Peatland	P

Veep	Ballyveeny	F835050	Mayo	Planted peatland	P
Veeu	Ballyveeny	F833050	Mayo	Peatland	P
Sub-project 3.1.2					
Bale	Ballyea	R197835	Clare	Prethicket SS plantation	P
Baly	Ballygiblin	R461027	Cork	Mature ash plantation	P
Barn	Barnadown	T139542	Wexford	Mature ash plantation	P
Boky	Buffanoky	R811564	Limerick	Mid-rotation SS plantation	P
Clyd	Clydaghroe	W182318	Kerry	Thicket SS plantation	P
Comm	Commeanaline	W900538	Tipperary	Thicket SS plantation	P
Cooa	Coolross	R720651	Tipperary	Prethicket SS plantation	P
Cool	Cooltmurraghy	M774276	Galway	Thicket ash plantation	P
Coon	Cooneen Hill	R916687	Tipperary	Mature SS plantation	P
Corb	Corbettstown	N539394	Offaly	Thicket ash plantation	P
Corr	Corracloon	R584913	Clare	Mid-rotation SS plantation	P
Cumm	Cummeenavrick	W142816	Kerry	Thicket SS plantation	P
Deme	Demesne	N831322	Kildare	Mature ash plantation	P
Derr	Derrybrien	R625010	Galway	Mature SS plantation	P
Doog	Dooglaun	R536916	Clare	Thicket SS plantation	P
Fury	Fuhiry	W144734	Cork	Mature SS plantation	P
Gfin	Garrafin	S291959	Laois	Thicket SS plantation	P
Glyn	Glynn's Hill	R551995	Clare	Thicket SS plantation	P
Kduff	Kilduffahoo	R788555	Limerick	Thicket SS plantation	P
Kila	Kilalongford	S967743	Carlow	Mature SS plantation	P
Kilm	Kilmacow	W979926	Cork	Prethicket SS plantation	P, S, M

Lurg	Lurgan Great	M761227	Galway	Prethicket SS plantation	P
Mary	Marymount	S260938	Laois	Thicket SS plantation	P
Msop	Monasop	S278995	Laois	Mature SS plantation	P
Mvan	Moanvaun	R891554	Tipperary	Thicket ash plantation	P
Rath	Rathcarrick	G636349	Sligo	Mature SS plantation	P
Reen	Reenavanna	R849544	Limerick	Thicket ash plantation	P
Rinc	Rincrew	X081818	Waterford	Mature ash plantation	P
Sagg	Derrynasaggart	W144800	Cork	Mid-rotation SS plantation	P
Sinb	Sinotts Bog	T061663	Wexford	Mature SS plantation	P
Suns	Sunderlands	T250809	Wicklow	Mature SS plantation	P
Trum	Trumra	292958	Laois	Mid-rotation SS plantation	P
Sub-project 3.1.3					
Athn	Athdown	O079158	Wicklow	OS transect in mature SS plantation	P
Bawn	Bawnogue	O016032	Wicklow	Forest road edge in clearfelled plantation	P
Bmut	Ballysmuttan	O045145	Wicklow	OS transect in mature SS plantation	P
Card	Cardtown	S277994	Laois	Forest road edge in clearfelled plantation	P
Carr	Carrigagulla	W375836	Cork	OS transect in mature SS plantation	P
Clea	Cleanglass	R234216	Limerick	OS transect in mature SS plantation	P
Cloo	Clootycarthy	W208707	Cork	Forest road edge in clearfelled plantation	P

Cura	Ballycurragh	T052822	Wicklow	OS transect in mature SS plantation	P
Foss	Fossyhill	S549891	Laois	Forest road edge in clearfelled plantation	P
Gate	Ballingate	S976605	Wicklow	Forest road edge in clearfelled plantation	P
Glan	Glannaharee	W454883	Cork	OS transect in mature SS plantation	P
Gull	Carrigagulla	W371837	Cork	Forest road edge in clearfelled plantation	P
Knoc	Knocknagoum	Q958215	Kerry	OS transect in mature SS plantation	P
Lugg	Lugg	O032246	Dublin	OS transect in mature SS plantation	P
Meen	Meentinny	R251135	Cork	OS transect in mature SS plantation	P
More	Lismore	S027063	Waterford	Forest road edge in clearfelled plantation	P
Muck	Mucklagh One	T085864	Wicklow	OS transect in mature SS plantation	P
Rean	Reanahoun	R256200	Cork	OS transect in mature SS plantation	P
Stoe	Ballinastoe	O180084	Wicklow	OS transect in mature SS plantation	P
Toor	Tooranahareen	S128061	Waterford	Forest road edge in clearfelled plantation	P

APPENDIX 2. New county records (NCR) of the species surveyed. Parentheses indicate the site code and number of individuals sampled; Site codes followed by either 'S' or 'M' denotes a specimen trapped with either a Vortex suction sampler (S) or Malaise trap (M).

Species	No. NCR	New County Records
Family Segestriidae		
Segestria senoculata (Linnaeus)	2	LIM (Curr=3, Moig=1); OFF (Bght=3)
Family Gnaphosidae		
Drassodes cupreus (Blackwall)	1	WAT (More=1)
Drassodes lapidosus (Walckenaer)	1	KLK (Cast=1)
Haplodrassus signifer (C.L. Koch)	2	COR (Cloo=1, Gull=2, Meen=1, Rean=2)
Micaria pulicaria(Sundevall)	1	LAO (Card=1)
Family Clubionidae		
Agroeca proxima (O.P.-Cambridge)	3	COR (Meen=5); KER (Clyd=1); MAY (Veep=1)
Clubiona brevipes (Blackwall)	1	TIP (KilbM)
Clubiona comta (C.L. Koch)	4	COR (KilmM=1); LEI (Raup=1); LIM (Clop=1, Clou=2, Curr=1); OFF (Bght=1)
Clubiona diversa (O.P.-Cambridge)	2	TIP (MntpM=2, Mvan=1); WIC (SlipM=1, Sliu=2, SliuM=1)
Clubiona lutescens (Westring)	2	KLK (Ratr=1); TIP (CooaM=12, MntpM=19)
Clubiona trivialis (C.L. Koch)	5	CLA (Bale=1); KER (Geap=1, ToguM=3, ToopM=2, Toou=11); LIM (Clea=1); MAY (Veeu=1); TIP (CooaM=1)
Family Zoridae		
Zora spinimana (Sundevall)	2	LAO (Foss=1); WAT (More=24)

Family Thomisidae		
Ozyptila trux (Blackwall)	2	KLK (Cast=11, Kill=4, Muny=6); LIM (Clea=6, Clop=1, Clou=3, Curr=4, Moig=7, Reen=4)
Philodromus cespitum (Walckenaer)	1	TIP (CooaM=1, KilbM=1, MntpM=33)
Tibellus maritimus (Menge)	3	COR (Cloo=1); LAO (Foss=1); WAT (More=1)
Tibellus oblongus (Walckenaer)	1	MAY (Veeu=1)
Xysticus cristatus (Clerck)	1	KLK (Cast=3, Kill=1)
Xysticus erraticus (Blackwall)	1	DON (Tieu=1)
Xysticus ulmi (Hahn)	1	KER (Geap=1)
Family Salticidae		
Neon reticulatus (Blackwall)	1	COR (Carr=1)
Family Lycosidae		
Alopecosa pulverulenta (Clerck)	4	KLK (Cast=2, Kill=1, Muny=1, Ratr=1); LAO (Agho=1, Card=11, Foss=7); LEI (Raup=2, Rauu=2); WES (Hanp=1)
Arctosa perita (Latrielle)	1	LAO (Foss=1)
Pardosa agrestis (Westring)	1	TIP (Kilb=1, Mntp=1)
Pardosa agricola (Thorell)	1	TIP (Mntp=1)
Pardosa amentata (Clerck)	1	KLK (Cast=54, Kill=45, Muny=31, Ratr=72)
Pardosa nigriceps (Thorell)	3	LAO (Clar=3, Glas=1, Lead=5); LIM (Clea=5, Clop=10, Clou=2, Reen=3); WES (Hanp=1)
Pardosa palustris (Linnaeus)	4	KLK (Cast=14, Kill=20); LAO (Card=2, Clar=17, Foss=11, Msop=1); LIM (Clop=1, Clou=83, Curr=17, Moig=35); WAT (Moaf=9, More=2, Toor=3)
Pirata hygrophilus (Thorell)	2	MAY (Veeu=1); WAT (Toor=1)
Pirata latitans (Blackwall)	4	CLA (Doog=6); GAL (Incp=1); LAO (Card=9, Mary=1); LIM (Moig=2)

Pirata uliginosus (Thorell)	9	COR (Carr=24, Cloo=2, Fury=1, Glan=1, Kilm=3, Meen=1, Rean=15); DON (Tiep=6); GAL (Incp=7) KER (Geap=79, Geau=44, Knoc=4, Togp=8, Togu=5, Toou=5); LAO (Card=18); LIM (Clea=7, Clou=1); MAY (Veep=31, Veeu=20); WAT (More=7); WES (Hanp=1); WIC (Bmut=1, Slip=11)
Trochosa spinipalpis (O.P.-Cambridge)	11	CLA (Bool=32, Garv=3); COR (Glen=8, Knaw=7); DUB (Lugg=1); GAL (Incu=3); KER (Geap=1, Geau=3); KLK (Muny=2); LAO (Clar=1, Glas=1); LEI (Raup=17, Rauu=34); TIP (Balp=1, Cooa=1, Doon=1, Mntp=1); WAT (More=1); WIC (Gate=2)
Trochosa terricola (Thorell)	2	LAO (Agho=1, Clar=5, Dong=1, Foss=6, Gfin=1, Glas=1, Lead=1); LEI (Raup=1,Rauu=3)
Family Pisauridae		
Dolomedes fimbriatus (Clerck)	1	LIM (Curr=8)
Pisaura mirabilis (Clecrk)	2	LAO (Card=2); LEI (Raup=1)
Family Dictynidae		
Cryphoeca silvicola (C.L. Koch)	5	COR (Knaw=1); DON (Tiep=1); LAO (Foss=1); LIM (Curr=2); OFF (Bght=1)
Family Hahniidae		
Antistea elegans (Blackwall)	2	DON (Carp=1, Caru=12, Tiep=2, Tieu=12); LIM (Clea=2, Curr=3)
Hahnia montana (Blackwall)	1	WIC (Sliu=2)
Hahnia nava (Blackwall)	2	COR (Clar=1); LIM (Clea=1)
Family Mimetidae		
Ero cambridgei (Kulczynski)	3	LIM (Clop=1, Curr=1); MAY (Veep=5); WIC (Gate=2, Slip=1)
Ero furcata (Villers)	1	LIM (Clea=1)
Family Theridiidae		
Euryopsis flavomaculata (L. Koch)	2	MAY (Veeu=30); WAT (More=8)
Pholcomma gibbum (Westring)	4	DON (Carp=1); LIM (Clop=1); TIP (Balp=2); WIC (Bawn=2, Bmut=1, Slip=2)
Robertus arundineti (O.P.-Cambridge)	2	COR (Glan=1); KER (Geap=2, Togp=1, Togu=1)

Robertus lividus (Blackwall)	2	LAO (Agho=1, Card=31, Foss=21, Gfin=16, Glas=4, Lead=35, Mary=44, Msop=10, Trum=40); LEI (Raup=2)
Robertus neglectus (O.P.-Cambridge)	2	CLA (Doog=5); KLK (Kill=1)
Theonoe minutissima (O.P.-Cambridge)	7	CAR (Kila=1); FER (Gore=1); KER (Cumm=7, Geap=1, Knoc=5, Togp=3, Toop=1, ToopS=5, ToouS=2); LAO (Msop=1); LIM (Clea=25); WAT (Toor=1); WEX (Sinb=3)
Theridion bimaculatum (Linnaeus)	2	TIP (MntpM=1); WAT (More=2, Toor=2)
Theridion impressum (L. Koch)	3	FER (MullM=1); KLK (BalbM=1); TIP (MntpM=2)
Theridion instabile (O.P.-Cambridge)	6	KLK (Ratr=1); LAO (Gfin=1, Lead=1); LEI (Raup=1); OFF (Corb=1); TIP (Cooa=3); WIC (SlipM=1)
Theridion varians (Hahn)	1	TIP (MntpM=1)
Family Nesticidae		
Nesticus cellulanus (Thorell)	1	WIC (Athn=1)
Family Tetragnathidae		
Meta mengei (Blackwall)	4	CAR (Kila=1); DUB (Lugg=1); LIM (Clop=2, Kduf=1); WAT (Toor=1)
Meta merianae (Scopli)	1	LIM (Boky=1, Kduf=1)
Meta segmentata (Clerck)	4	KLK (BalbM=3, Kill=1, Muny=1); LAO (Glas=1); LIM (Moig=1); TIP (MntpM=6)
Pachygnatha degeeri (Sundevall)	2	LEI (Rauu=2); LIM (Clop=8, Clou=17, Curr=2, Moig=20)
Tetragnatha montana (Simon)	2	GAL (IncpM=3, IncuM=12); LIM (Moig=1)
Family Araneidae		
Araniella opistographa (Kulczynski)	2	GAL (IncuM=1); TIP (KilbM=1)
Episinus truncatus (Latrielle)	1	COR (Kilm=1)
Hyposinga pygmaea (Sundevall)	1	DON (Carp=1)
Family Theridiosomatidae		
Theridiosoma gemmosum (Koch)	2	LIM (Clop=1); TIP (CooaM=1)

Family Linyphiidae		
Agyneta cauta (O.P.-Cambridge)	4	GAL (Incu=1), KER (Geap=5), MAY (Veep=12)
Agyneta conigera (O.P.-Cambridge)	7	KER (Togp=1), KLK (Muny=1), LIM (Boky=1, Clou=1, Kduf=1), MAY (Veep=1), OFF (Bght=2), TIP (Comm=4, Flem=1, Kilb=1), WIC (Slip=1, Sliu=1)
Agyneta decora (O.P.-Cambridge)	9	CLA (Bool=1), COR (Coog=3), KLK (Kill=1),LAO (Agho=5, Clar=3, Foss=3), LIM (Kduf=1, Moig=1, Reen=2), MAY (Veep=40, Veeu=25), TIP (Balu=9, Comm=1, Doon=1, Mvan=1), WAT (More=68, Toor=1), WES (Hanp=1)
Agyneta olivacea (Emerton)	9	CLA (Garv=1), COR (Cloo=1, Glan=19, Kilm=1, Meen=5, Rean=7), GAL (Incp=39), KER (Clyd=2,Geap=29, Geau=12, Knoc=30, Togp=2, Togu=24, Toou=5), LAO (Clar=1), LEI (Rauu=1), LIM (Clea=3, Kduf=1, Moig=1), MAY (Veep=123, Veeu=10), WAT (Rinc=1, Toor=1)
Agyneta ramosa (Jackson)	14	CAR (Kila=11), CLA (Bool=24, Corr=1, Garv=13), COR (Clar=6, Cloo=6, Coog=1, Glan=25, Gull=6, Knaw=7, Meen=5, Rean=4), DON (Caru=9, Tieu=3), DUB (Lugg=4), KER (Geap=1, Knoc=102, Toou=1), KLK (Muny=1, Ratr=1), LAO (Agho=1, Card=2, Clar=4, Foss=8, Glas=8, Lead=1), LEI (Raup=1, Rauu=1), LIM (Boky=4, Clea=17), MAY (Veep=8), TIP (Balp=6, Balu=3, Mntp=1), WAT (More=16, Toor=21), WEX (Sinb=1), WIC (Athn=5, Bawn=61, Bmut=9, Cura=5, Gate=5, Muck=12)
Agyneta subtilis (O.P.-Cambridge)	8	KLD (Deme=10), KLK (Kill=3), LAO (Card=7, Foss=11, Gfin=5, Glas=15, Mary=1, Msop=13, Trum=4), LEI (Raup=17, Rauu=6), LIM (Boky=2, Clea=111, Curr=6, Kduf=2, Moig=5, Reen=1), SLI (Rath=11), WAT (More=60, Toor=37), WES (Hanp=1)
Allomengea scopigera (Grube)	1	KER (Cumm=1)
Allomengea vidua (L. Koch)	1	LIM (Clop=1)
Aphileta misera (O.P.-Cambridge)	2	COR (Glan=1); KER (Clyd=2, Cumm=3)
Araeoncus crassiceps (Westring	3	GAL (IncuM=1); KER (ToouM=1); MAY (Veeu=16)

Asthenargus paganus (Simon)	11	CLA (Coor=10, Doog=2, Glyn=10); DUB (Lugg=18); FER (Gore=1); GAL (Derr=22); KLD (Deme=1); KLK (Cast=2); LAO (Card=5, Foss=4, Gfin=3, Lead=1, Mary=15, Msop=8, Trum=13); LIM (Boky=16, Clea=2); TIP (Comm=6, Coon=12); WEX (Sinb=15); WIC (Athn=15, Bawn=14, Bmut=12, Cura=11, Gate=3, Muck=31, Stoe=10, Suns=11)
Baryphma trifons (O.P.-Cambridge)	5	KLK (Balb=1, Kill=1, Muny=3); LAO (Clar=1, Glas=2, Lead=2); LEI (Raup=2, Rauu=3); LIM (Clop=2, Curr=2); MAY (Veeu=1)
Bathyphantes approximatus (O.P.-Cambridge)	3	KLK (Ratr=2); LAO (Lead=1); LIM (Clou=8, Curr=1)
Bathyphantes gracilis (Blackwall)	1	LIM (Boky=3, Clea=8, Clop=22, Clou=55, Curr=18, Kduf=13, Moig=17, Reen=35)
Bathyphantes nigrinus (Westring)	5	LAO (Card=1, Clar=3, Foss=5, Glas=12, Lead=26); LEI (Raup=4, Rauu=1); LIM (Clea=7, Clop=3, Clou=1, Kduf=1, Reen=3); OFF (Bght=2, Corb=1), SLI (Rath=1)
Bathyphantes parvulus (Westring)	10	CLA (Bale=22, Bool=4, Doog=4, Garv=16, Glyn=4); COR (Clar=2, Cloo=2, Coog=2, Glen=19, Kilm=21); DUB (Lugg=4); GAL (Cool=16, Incp=3, Incu=2, Lurg=43); KER (Cumm=1, Geap=3, Geau=3, Togp=9, TogpS=2, Togu=6, Toop=2, Toou=1, ToouM=1); KLK (Balb=7, BalbM=4,Cast=4, Kill=8, Muny=107, Ratr=68); LEI (Raup= 18, Rauu=1); LIM (Clea=1, Clop=21, Clou=7, Curr=29, Kduf=1, Moig=9, Reen=5); MAY (Veep=1, Veeu=32); TIP (Balp=10, Balu=23, Coon=7, Cooa=23, CooaS=1, CooaM=2, Doon=1, Flem=61, Kilb=6, Mntp=3, MntpM=1, Mvan=4)
Bathyphantes setiger (O.P.-Cambridge)	1	GAL (Incu=1)
Centromerita concinna (Thorell)	1	LAO (Card=3, Clar=2)
Centromerus arcanus (O.P.-Cambridge)	1	WAT (More=2, Toor=1)

Centromerus dilutus (O.P.-Cambridge)	7	FER (Gore=2); KER (Clyd=4, Cumm=7, Knoc=11, Toop=1); KLD (Deme=2); LIM(Boky=4, Clea=24); MAY (Veep=1); SLI (Rath=2); WAT (Moaf=1, More=3)
Centromerus prudens (O.P.-Cambridge)	1	LIM (Clea=1)
Centromerus sylvaticus (Blackwall)	3	LIM (Clou=1); TIP (Balp=1); WIC (Bawn=1, Gate=1, Stoe=1)
Ceratinella brevipes (Westring)	3	DON (Carp=58, Caru=77, Tiep=60, Tieu=38); LIM (Clea=8, Clop=1, Curr=6, Moig=1); WAT (Moaf=1, More=30, Toor=8)
Ceratinella brevis (Wider)	6	CAR (Kila=1); GAL (Incp=3); LEI (Raup=1, Rauu=3); LIM (Clea=1); MAY (Veep=5); WAT (Moaf=6, Toor=6)
Ceratinella scabrosa (O. P.-Cambridge)	11	COR (Kilm=2, Knaw=1); KLD (Deme=7); KLK (Cast=9, Kill=2, Muny=8, Ratr=5); LAO (Clar=4, Foss=1, Glas=1, Trum=2); LEI (Raup=14, Rauu=8); LIM (Clop=4, Clou=36, Curr=26, Moig=27); OFF (Bght=9); WAT (Moaf=10); WES (Hanp=17); WEX (Barn=1, Sinb=1); WIC (Slip=1, Suns=4)
Cnephalocotes obscurus (Blackwall)	4	DON (Caru=3, Tieu=22); DUB (Lugg=2); LEI (Rauu=2); OFF (Corb=1)
Dicymbium nigrum (Blackwall)	4	COR (Coog=1, Glen=2, Gull=1, Kilm=2, Knaw=4, Meen=1); LEI (Raup=4, Rauu=15); LIM (Clop=2, Clou=3, Curr=2, Moig=6); WAT (Moaf=1, More=7)
Dicymbium tibiale (Blackwall)	13	CLA (Bale=3, Corr=1, Doog=21); COR (Baly=34, Clar=4, Cloo=1, Glan=6,Gull=3, Kilm=25, Meen=4, Rean=7); DUB (Lugg=7); FER (Gore=1); GAL (Cool=4, Incp=1, Lurg=3); KER (Clyd=2, Cumm=90, Knoc=1); KLD (Deme=2); LAO (Card=10, Clar=2, Foss=20, Gfin=1, Msop=1); LIM (Clea=2, Kduf=1, Moig=1, Rean=33); OFF (Corb=15); SLI (Rath=48); TIP (Comm=2, Cooa=5, Kilb=2, Mntp=1, Mvan=12); WEX (Barn=19, Sinb=34)
Diplocentria bidentata (Emerton)	1	WAT (MoafS=1)

Diplocephalus latifrons (O.P.-Cambridge)	10	COR (Baly=96, Clar=58, Cloo=2, Fury=49, Glan=81, Gull=19, Kilm=1, Meen=127, Rean=97, Sagg=65); DON (Tieu=1); GAL (Derr=18); LAO (Card=3, Foss=18, Gfin=17, Glas=9, Mary=31, Msop=68, Trum=70); LIM (Boky=46, Clea=86, Kduf=23); SLI (Rath=37); TIP (Balu=2, Comm=13, Coon=36, Gary=3, Kilb=2, Mntp=1, Mvan=1); WAT (More=10, Toor=2); WEX (Barn=20, Sinb=106); WIC (Athn=7, Bawn=8, Bmut=57, Cura=119, Gate=11, Muck=121, Stoe=43, Suns=145)
Diplocephalus permixtus (O.P.-Cambridge)	3	DUB (Lugg=2); LIM (Clea=3, Clop=1, Moig=15); MAY (Veeu=2)
Diplocephalus picinus (Blackwall)	4	KLD (Deme=1); LEI (Rauu=2); OFF (Bght=2); WIC (Suns=3)
Diplostyla concolor (Wider)	3	LAO (Foss=22, Lead=2); WAT (Toor=5); WES (Hanp=1)
Dismodicus bifrons (Blackwall)	8	DON (Carp=4, Caru=1, Tiep=7, Tieu=6); KLK (Balb=1, BalbM=27, Cast=5, Kill=9, Muny=11, Ratr=19); LEI (Raup=6, Rauu=4); LIM (Clea=2, Clop=10, Clou=6, Curr=3, Kduf=10, Moig=2, Rean=1); OFF (Bght=10); SLI (Rath=2); WAT (Moaf=3, More=19, Toor=29); WES (Hanp=3)
Drepanotylus uncatus (O.P.-Cambridge)	1	DON (Tieu=1)
Erigone dentipalpis (Wider)	3	KLK (Cast=17, Kill=57); LAO (Agho=6, Card=3, Clar=4, Dong=1, Foss=16);WIC (Athn=1, Gate=2, SliuM=1, Stoe=9)
Erigone longipalpis (Sundevall)	3	CAR (Kila=1); TIP (Comm=3, Coon=1, Kilb=2); WAT (Moaf=1)
Erigonella hiemalis (Blackwall)	5	COR (Gull=1); KER (Knoc=1, Toou=1); KLD (Deme=9); LAO (Card=2, Dong=1, Foss=7, Lead=1); LIM (Moig=2, Rean=1)
Erigonella ignobilis (O.P.-Cambridge)	2	KER (Geap=1, Geau=1); WAT (More=1)
Gongylidiellum latebricola (O.P.-Cambridge)	3	DON (Carp=1); GAL (Incp=7, Incu=2); KER (Geap=4, Knoc=2, Togp=1, Togu=4, Toop=1, Toou=1)

Gongylidiellum vivum (O.P.-Cambridge)	5	COR (Carr=8, Coog=3, Cloo=1, Fury=12, Glan=29, Glen=1, Gull=6, Kilm=76, Knaw=4, Meen=9, Rean=9, Sagg=5); DUB (Lugg=16); KLD (Deme=3); LIM (Boky=6, Clea=19, Clop=5, Clou=9, Curr=6, Kduf=25, Moig=1, Rean=16); WIC (Athn=5, Bawn=31, Bmut=2, Cura=7, Gate=9, Muck=6, Slip=8, Sliu=3, SliuM=1, Stoe=13, Suns=11)
Gongylidum rufipes (Linnaeus)	4	GAL (IncuM=1); KER (Clyd=1, Cumm=2, Geau=1); KLK (Muny=1); WIC (Athn=1)
Hilaira excisa (O. P.-Cambridge)	8	CAR (Kila=1); DON (Carp=1); DUB (Lugg=1); GAL (Derr=1); KER (Clyd=1); LAO (Gfin=1, Mary=1); LIM (Clea=1, Rean=2); TIP (Comm=24, Coon=3, Mvan=3)
Hypselistes jacksoni (O.P.-Cambridge)	3	DON (Carp=2, Caru=1, Tiep=1, Tieu=7); KER (Geau=2); WIC (Bawn=5)
Kaestneria pullata (O.P.-Cambridge)	7	DON (Tiep=3, Tieu=7); GAL (Lurg=2); KER (Toop=2, ToopM=8, Toou=7); KLK (Balb=1, Muny=4); MAY (Veeu=1); OFF (Corb=4); TIP (Mvan=6)
Lepthyphantes alacris (Blackwall)	11	DUB (Lugg=35); KLD (Deme=1); KLK (Cast=1); LAO (Card=1, Gfin=2, Lead=9, Msop=10, Trum=10); LEI (Raup=3); LIM (Boky=25, Clea=121, Kduf=2); MAY (Veeu=1); SLI (Rath=56);TIP (Balp=3, Balu=1, Comm=2, Coon=6, Doon=3, Flem=1); WEX (Barn=1, Sinb=9); WIC (Athn=34, Bawn=1, Bmut=48, Cura=24, Gate=3, Muck=49, Slip=2, Stoe=10, Suns=14)
Lepthyphantes cristatus (Menge)	4	LAO (Agho=1, Card=1, Clar=1, Glas=5, Lead=3); LEI (Raup=3); TIP (Balp=6, Balu=1, Cooa=1, Mvan=3); WAT (Toor=2)
Lepthyphantes ericaeus (Blackwall)	3	DON (Carp=14, Caru=22, Tiep=8, Tieu=15); KLK (Balb=5, BalbM=1, BalbS=3, Cast=2, Muny=9, Ratr=28); LEI (Raup=8, Rauu=5)
Lepthyphantes flavipes (Blackwall)	7	CLA (Bale=1, Doog=2, Glyn=3); KER (Cumm=1, Toop=1); KLD (Deme=2); KLK (Kill=2); LEI (Raup=6); LIM (Clea=4, Kduf=3); SLI (Rath=97)
Lepthyphantes mengei (Kulczynski)	3	LEI (Raup=4, Rauu=7); LIM (Clea=8, Clop=5, Clou=6); WAT (More=11, Toor=11)
Lepthyphantes nebulosus (Sundervall)	1	OFF (Corb=1)

Lepthyphantes obscurus (Blackwall)	5	GAL (Derr=1), KLD (Deme=1); LIM (Clea=8, Kduf=1); TIP (Balu=1, Comm=3, Coon=1, KilbM=2, Mntp=2, MntpM=1); WIC (Athn=9, Bawn=2, Bmut=1, Cura=3, Muck=2, SlipM=1, SliuM=1, Stoe=6)
Lepthyphantes pallidus (O.P.-Cambridge)	7	KLK (Balb=2); LAO (Card=1, Gfin=1, Lead=2, Msop=2, Trum=1); LEI (Raup=1); LIM (Boky=1, Clea=1); SLI (Rath=2); WAT (Toor=2); WIC (Athn=2, Bawn=3, Suns=1)
Lepthyphantes tenebricola (Wider)	16	CAR (Kila=100); CLA (Corr=12, Doog=7, Glyn=10); DUB (Lugg=72); GAL (Derr=1, IncpM=1, Lurg=1); KER (Clyd=1, Knoc=1, ToguS=1); KLD (Deme=13); KLK (Balb=1); LAO (Card=12, Clar=1, Foss=1, Gfin=5, Glas=6, Mary=2, Msop=51, Trum=25); LEI (Raup=2, Rauu=1); LIM (Boky=33, Kduf=2, Moig=1); SLI (Rath=88); TIP (Balp=1, Balu=2, Comm=5, Coon=31, Doon=2, Flem=2); WAT (Moaf=3, Rinc=23, Toor=11); WES (Hanp=1); WEX (Barn=4, Sinb=28), WIC (Athn=20, Bawn=2, Bmut=15, Cura=12, Gate=20, Muck=30, Stoe=21, Suns=23)
Lepthyphantes tenuis (Blackwall)	1	DON (Carp=8, Caru=3, Tiep=3, Tieu=2)
Lepthyphantes zimmermanni (Bertkau)	1	LIM (Boky=193, Clea=147, Clop=14, Clou=4, Curr=3, Kduf=31, Moig=1)
Leptporhoptrum robustum (Westring)	8	COR (Glen=1, Knaw=2); KLK (Balb=2, Kill=6, Cast=7, Ratr=1); LEI (Raup=3, Rauu=3); LIM (Clea=7, Clop=2, Clou=6, Curr=1, Kduf=4, Moig=2, Rean=3); OFF (Bght=22, Corb=4); SLI (Rath=2); WAT (Moaf=2, More=1); WES (Hanp=6)
Linyphia hortensis (Sundevall)	1	KLD (Deme=1)
Linyphia triangularis (Clerck)	1	KLD (Deme=1)
Lophomma punctatum (Blackwall)	5	DON (Carp=10, Caru=4, Tiep=3, Tieu=4); KLK (Balb=1, Ratr=1); LEI (Raup=4, Rauu=3); LIM (Clea=2, Clop=1, Clou=1, Kduf=1, Moig=3 Rean=2); MAY (Veeu=3)
Macrargus rufus (Wider)	2	LAO (Msop=1); WIC (Bmut=2)

Maro minutus (O.P.-Cambridge)	11	CAR (Kila=13); CLA (Bool=6, Corr=2, Garv=2); COR (Carr=18, Glan=4, Gull=5, Meen=1, Rean=4); DUB (Lugg=63); KER (Cumm=12; Geau=7; Togp=2); KLD (Deme=2); LAO (Card=34, Foss=4, Msop=9, Trum=13); LIM (Boky=1, Clea=23, Clop=1, Clou=1); MAY (Veep=1); TIP (Balb=3, Comm=1, Coon=6, Flem=1); WIC (Athn=8, Bawn=5, Bmut=1, Cura=15, Gate=9, Muck=6, Slip=1, Sliu=1, Stoe=15, Suns=10)
Maso sundevalli (Westring)	2	WAT (Moaf=1); WIC (Bmut=1, Cura=1, Muck=1, Slip=1, SlipS=1, Sliu=4)
Meioneta beata (O.P.-Cambridge)	1	DON (Tieu=15)
Meioneta rurestris (C. L. Koch)	1	COR (Cloo=1)
Meioneta saxatilis (Blackwall)	9	CLA (Corr=1, Doog=3, Glan=1); DUB (Lugg=6); GAL (Incu=1); KLK (Cast=2, Muny=2); LAO (Agho=3; Dong=1, Foss=1, Glas=2, Lead=1); OFF (Bght=7, Corb=1); TIP (Balu=7, Gary=1); WAT (Toor=2); WES (Hanp=3)
Metopobactrus prominulus (O.P.-Cambridge)	9	CAR (Kila=1); CLA (Bale=5, Garv=10, Glyn=1); COR (Baly=1, Clar=3, Glan=1, Gull=1); DON (Carp=3, Caru=13, Tiep=7, Tieu=1); KER (Cumm=18, Geap=3, Geau=1, Togp=4, Togu=1, Toop=8); KLK (Kill=1, Muny=19); LAO (Agho=1, Lead=1); TIP (Balb=1, Doon=47, Flem=1, Kilb=1, Mvan=1); WEX (Sinb=1)
Micrargus herbigradus (Blackwall)	15	CAR (Kila=2); COR (Carr=2, Cloo=2, Fury=1, Glan=3, Gull=2, Kilm=2, Meen=2, Rean=2, Sagg=2); DON (Carp=1, Caru=5, Tiep=6, Tieu=6); DUB (Lugg=3); GAL (Incp=4, Lurg=4); KER (Clyd=14, Cumm=12, Geap=1, Geau=1, Knoc=3, Togp=1, TogpS=1); KLD (Deme=1); LAO (Card=2, Foss=1, Gfin=1, Glas=3, Lead=1, Trum=1); LEI (Raup=3, Rauu=2); LIM (Boky=2, Clea=5, Clop=3, Clou=1, Kduf=12); MAY (Veep=5, Veeu=1); SLI (Rath=4); TIP (Coom=3, Cooa=6, Coon=3, MntpS=1, Mvan=2); WAT (More=2, Toor=2); WEX (Sinb=2)
Micrargus subaequalis (Westring)	8	COR (Cloo=3, Kilm=23, KilmS=1, Knaw=1); GAL (Lurg=4); KLK (Cast=1, Kill=8, Ratr=2); LAO (Agho=4, Clar=1, Dong=3, Foss=2, Glas=1, Lead=1); LIM (Kduf=2, Reen=1); WAT (More=2, Toor=1); WES (Hanp=1); WIC (Gate=2)
Microlinyphia pusilla (Sundevall)	1	LIM (Clea=1, Kduf=1)

Microneta viaria (Blackwall)	1	KLD (Deme=6)
Milleriana inerrans (O.P.-Cambridge)	1	KER (TogpM=1)
Minyriolus pusillus (Wider)	2	WAT (More=2); WIC (Bawn=1, Gate=3)
Monocephalus castaneipes (Simon)	3	COR (Carr=1, Meen=1); SLI (Rath=1); WIC (Athn=1, Bmut=1, Muck=1)
Monocephalus fuscipes (Blackwall)	5	LAO (Card=3,Clar=5, Foss=19, Gfin=25, Glas=18, Lead=16, Mary=62, Msop=26, Trum=33); LEI (Raup=42, Rauu=21); LIM (Boky=29, Clea=90, Clop=9, Clou=17, Curr=70, Kduf=64, Moig=20, Rean=5); WAT (Moaf=4, More=13, Rinc=1); WES (Hanp=6)
Nereine clathrata(Sundevall)	1	LEI (Raup=6, Rauu=7)
Neriene montana (Clerck)	2	LEI (Rauu=1); LIM (Clou=1)
Neriene peltata (Wider)	2	COR (Carr=4, Glan=3, Glen=2); LIM (Boky=2, Clou=2, Clea=2, Kduf=1)
Oedothorax fuscus (Blackwall)	2	LAO (Agho=23, Card=7, Clar=51, Dong=25, Foss=4, Gfin=7, Msop=1); WIC (Bawn=1, Gate=2, Slip=2, SlipM=1, SliuM=1, Stoe=1, Suns=5)
Oedothorax gibbosus (Blackwall)	6	DUB (Lugg=4); KER (Clyd=1, Cumm=5, Geap=35, Geau=2, Knoc=14, Togp=12, Togu=7, Toop=6, ToopM=1, Toou=11, ToouM= 2); KLK (Cast=3, Kill=1, Muny=9, Ratr=6); LIM (Clea=35, Clop=1, Clou=6, Curr=6, Kduf=2, Moig=2, Rean=16); MAY (Veep=11, Veeu=29); TIP (Comm.=4, Coon=2, Doon=2, Flem=3, Kilb=12)
Oedothorax retusus (Blackwall)	4	DON (Tiep=2); KLD (Deme=1); LIM (Clop=7, Clou=13, Kduf=3, Moig=2, Reen=4); WAT (Moaf=2, More=3, Rinc=1)
Pelecopsis mengei (Simon)	2	LEI (Raup=1, Rauu=1); WIC (Sliu=3)
Pelecopsis nemoralis (Blackwall)	4	CLA (Corr=1); COR (Glan=1, Gull=1, Mean=1, Reen=1); LIM (Boky=1, Clea=3, Curr=1, Kduf=1); WIC (Athn=1, Bmut=3, Cura=1, Muck=1, Stoe=1)
Pelecopsis parallela (Wider)	4	DON (Tiep=1, Tieu=4); KER (Geap=1); LIM (Boky=1); WIC (Bmut=3, Muck=1, Suns=1)
Peponocranium ludicrum (O. P.-Cambridge)	3	GAL (Incp=8, IncpS=1, IncpM=3, Incu=1; IncuS=1); LIM (Clea=1); WAT (More=4)

Pocadicnemis juncea (Locket & Millidge)	16	CLA (Bale=12, Bool=7, Doog=3 , Garv=3, Glyn=1); COR (Carr=1, Glen=44, Gull=1, Kilm=10, Knaw=74, Rean=1); DON (Carp=5, Tiep=5, Tieu=1); DUB (Lugg=1); FER (Gore=3, Mull=1, MullM=1); GAL (Cool=6, Incp=15, Incu=1, Lurg=11); KER (Geap=8, Geau=1, Togp=6, TogpM=2, TogpS=1, Togu=2, Toop=3, Toou=1, ToouM=1); KLK (Balb=4, BalbM=21; BalbS=22, Cast=22, Kill=53, Muny=296, Ratr=18); LAO (Agho=9, Card=15, Clar=5, Dong=3, Foss=16, Glas=32, Lead=29); LEI (Raup=27, Rauu=15); LIM (Clop=43, Clou=2, Curr=21, Moig=6, Reen=2); MAY (Veep=6); TIP (Balp=15, Balu=8, Cooa=5, Doon=4, Flem=4, Kilb=3, Mntp=4, Mvan=15); WAT (More=2, Toor=1); WES (Hanp=34); WIC (Athn=4, Bawn=37, Bmut=2, Gate= 4, Muck=2, Slip=29, SlipM=6, Sliu=26)
Pocadicnemis pumila (Blackwall)	3	KER (Clyd=20, Cumm=40, Geap=83, Geau=55, Knoc=50, Togp=26, TogpM=19, TogpS=3, Togu=20, Toop=25, ToopM=2, ToopS=2, Toou=17, ToouM=3, ToouS=1); LEI (Raup=5, Rauu=1); LIM (Boky=1, Clea=24, Clop=23, Clou=8, Curr=8, Kduf=3, Moig=2, Reen=2)
*Poeciloneta globosa (*Blackwall)	1	LIM (Clop=1, Clou=1)
Porrhomma campbelli (O. P.-Cambridge)	3	COR (Carr=1); GAL (Kerr=1); WIC (Muck=1)
Porrhomma convexum (Westring)	1	COR (Meen=1)
Porrhomma pallidum (Jackson)	9	CAR (Kila=1); COR (Carr=11, Cloo=2, Fury=1, Glan=3, Gull=1, Meen=6, Rean=4, Sagg=4); DUB (Lugg=8); GAL (Derr=5); LAO (Foss=3, Gfin=2, Mary=3, Trum=2); LIM (Boky=4, Clea=14); SLI (Rath=1); TIP (Comm=4, Coon=7); WEX (Sinb=3)
Porrhomma pygmaeum (Blackwall)	1	WIC (Bmut=3, Stoe=1)
Saaristoa abnormis (Blackwall)	10	DON (Carp=4, Caru=1, Tiep=2); DUB (Lugg=13); KLD (Deme=3); KLK (Balb=2, Ratr=1); LAO (Card=33, Foss=8, Gfin=40, Lead=3, Mary=64, Msop=52, Trum=8); LEI (Raup=1); LIM (Boky=26, Clea=21, Clop=5, Clou=1, Kduf=40); TIP (Balp=3, Comm=71, Coon=81, Flem=1, Mvan=1, Mntp=1); WAT (More=8, Toor=9); WEX (Barn=1, Sinb=66)

Saaristoa firma (O.P.-Cambridge)	10	CLA (Corr=1, Glyn=1); DUB (Lugg=4); KER (Clyd=7, Cumm=3, Knoc=5); KLD (Deme=1); KLK (Balb=1); LAO (Mary=2, Trum=1); LIM (Clea=4, Kduf=2); TIP (Balp=1; Coon=1, Flem=1); WAT (Toor=3); WIC (Muck=1, Sliu=1, Stoe=1)
Saloca diceros (O.P.-Cambridge)	1	CLA (Glyn=1)
Silometopus elegans (O.P.-Cambridge)	7	GAL (Incp=1, Incu=6); KER (Geap=90, Geau=16, Togp=8, TogpM=2, TogpS=1, Togu=23, ToguS=1, Toop=1, Toop=9); KLK (Balb=1); LAO (Agho=3, Card=1, Clar=5, Dong=1, Foss=4, Glas=6, Lead=3); LIM (Clea=9); MAY (Veep=21, Veeu=33); WAT (More=88, Toor=3)
Tallusia experta (O.P.-Cambridge)	2	LIM (Clou=6); MAY (Veeu=1)
Tapinocyba insecta (L. Koch)	2	KLD (Deme=1); LEI (Rauu=1)
Tapinocyba pallens (O.P.-Cambridge)	6	DON (Tiep=2, Tieu=1); DUB (Lugg=7); KER (Togu=1); LAO (Card=2, Foss=10, Msop=1, Trum=5); TIP (Coon=1); WIC (Athn=9, Bawn=3, Bmut=2, Gate=22, Stoe=3)
Tapinocyba praecox (O. P.-Cambridge)	1	LIM (Clea=1)
Taranuncus setosus (Simon)	10	DON (Carp=1, Tiep=1); DUB (Lugg=1); FER (Gore=1); GAL (Incp=2, Lurg=6); KLK (Muny=1, Ratr=1); LAO (Foss=1, Glas=3, Lead=15); LIM (Clou=2); MAY (Veep=10); TIP (Balp=1, Balu=1, Kilb=1); WIC (Slip=2)
Tiso vegans (Blackwall)	5	LAO (Agho=1, Dong=1, Foss=2); LEI (Rauu=1); LIM (Clop=1); WIC (Athn=1, Gate=1, SlipM=1, Sliu=12, Stoe=47)
Trichopterna thorelli (Westring)	2	GAL (Incu=2); MAY (Veeu=96)
Troxochrus scabriculus (Westring)	3	DON (Tieu=1); KLK (Cast=12, Kill=2, Ratr=4); LAO (Dong=8)
Walckenaeria acuminata (Blackwall)	4	LIM (Boky=7, Clea=8, Clop=4, Clou=1, Curr=10, Kduf=13, Moig=1); SLI (Rath=5); WAT (Moaf=3, More=16, Toor=2); WES (Hanp=11)
Walckenaeria atrobtibialis (O. P.-Cambridge)	9	CLA (Corr=1, Doog=2, Glyn=5); DON (Caru=6); GAL (Derr=1, Incp=36, Incu=1); KER (Geap=28, Geau=11, Knoc=13, Togu=1, Toop=3, Toou=16); KLK (Ratr=2); LAO (Card=1, Dong=2); MAY (Veep=2, Veeu=2); WAT (More=31, Toor=7); WIC (Sliu=4)
Walckenaeria clavicornis (Emerton)	1	DON (Tieu=1)

Walckenaeria cuspidata (Blackwall)	4	COR (Carr=1, Glan=8, Rean=5); DON (Carp=4, Caru=10, Tiep=5); LEI (Raup=1, Rauu=6); WAT (More=4, Toor=7)
Walckenaeria dysderoides (Wider)	9	CAR (Kila=8); CLA (Glyn=1); COR (Carr=1, Cloo=28, Glan=1, Gull=3); DUB (Lugg=5); KER (Knoc=1); TIP (Balu=1); WAT (More=1); WEX (Sinb=); WIC (Athn=32, Bmut=40, Gate=5, Sliu=1)
Walckenaeria kochi (O. P.-Cambridge)	2	CLA (Garv=1); DON (Carp=1)
Walckenaeria nodosa (O.P.-Cambridge)	4	CAR (Kila=1); KER (Clyd=1); LIM (Clea=1); MAY (Veeu=1)
Walckenaeria nudipalpis (Westring)	8	CLA (Bool=1, Corr=9, Doog=3); GAL (Derr=4, Incp=2, Incu=1); LAO (Card=11, Foss=3, Gfin=8, Mary=1, Msop=8, Trum=5); LIM (Boky=5, Clea=2, Moig=5, Rean=1); SLI (Rath=3); TIP (Comm=1, Coon=3); WAT (More=3); WES (Hanp=1)
Walckenaeria unicornis (O.P.-Cambridge)	6	FER (GoreM=1); LEI (Raup=1); LIM (Clop=2, Clou=2, Moig=1); MAY (Veeu=2); OFF (Bght=1); WIC (SlipM=1)
Walckenaeria vigilax (Blackwall, 1851)	12	CAR (Kila=23); COR (Carr=5, Cloo=5, Glan=4, Glen=2, Gull=11, Meen=2, Rean=3); KER (Clyd=14, Cumm=18, Geap=3, Geau=14, Knoc=7, Togp=6, Togu=22, ToguM=1, Toou=7); KLK (Muny=4); LAO (Card=32, Clar=11, Foss=5, Glas=2, Msop=2); LIM (Clea=7, Clop=31, Clou=12, Curr=7, Kduf=4, Moig=2, Rean=3); MAY (Veeu=16); OFF (Corb=1); TIP (Balp=1, Balu=3, Comm=5, Flem=1, Mntp=2, Mvan=26); WAT (More=21, Toor=5); WES (Hanp=3); WIC (Athn=13, Bawn=27, Cura=3, Bmut=12, Gate=2, Muck=12, Slip=2, Sliu=39, Stoe=35)

DRASSODES PUBESCENS (THORELL) (ARANEAE, GNAPHOSIDAE): A SPIDER NEW TO IRELAND FROM CALCAREOUS GRASSLAND

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Background

Orchid-rich calcareous grasslands are a priority habitat on the EU Annex I habitats guide (European Commission, 1996). An examination of a variety of invertebrate orders at 25 such sites was the subject of an EPA funded post-doctoral study carried out by ER through Trinity College, Dublin between 2005 and 2007. In 2006 MN was contracted by TCD, on foot of funding gained from the Heritage Council (WLD/2006/14776), to participate in this study with the mandate to partake in fieldwork and to identify spiders recorded during the survey.

Drassodes pubescens (Thorell, 1856)

A single male of *Drassodes pubescens* (Thorell) was identified from the catch taken in a set of ten pitfall traps established between 24 May and 14 June 2006 on Split Hills Esker, Co. Westmeath N346382. The location at which the traps were set has a strong gradient and was characterised by a sandy soil 5cm in depth. Vegetation at the site was short (5cm) and dominated by mountain everlasting *Antennaria dioica* (50-90% cover), with some quaking grass *Briza media*, wild thyme *Thymus polytrichus*, *Cladonia* lichens and mosses. The top of the ridge was

heavily colonised by tall gorse *Ulex* shrubs and rank grasses, which in the long-term could encroach on the site.

According to Helsdingen (1996), *D. pubescens* had not previously been noted from Ireland and there are no records subsequent to that publication. The specimen was identified using Roberts (1985). The male of the species is easily distinguished from the two congeners that occur in Ireland on basis of structures of the mature palp.

D. pubescens occurs in a wide range of habitats throughout Europe preferring dry oligotrophic grasslands, fallow meadows, coastal systems and especially sand-dunes thereof (Hänggi *et al.*, 1995). It also occurs in dry heaths and vegetation at woodland edges, on raised bog and bog heathland and on disturbed ground e.g. quarries. It is associated with pine *Pinus* forest (perhaps accounting to some extent for its occurrence on raised bog), with larch *Larix* and sometimes occurs in older oak *Quercus* dominated deciduous woodlands, especially oak/hornbeam *Carpinus*. It occurs occasionally amongst fen vegetation or on wetter grasslands. Almquist (2006) records it from *Pinus* woodland, and dune heath in Sweden. On Swedish sand-dune systems, it was found most abundantly on the landward side of dune ridges and amongst marram *Ammophila arenaria* (Almquist, 1973), extending inland into areas of heath.

The species is typical of the Gnaphosidae with respect to its habits, being ground-dwelling, nocturnal and cursorial. It may be found by day in a silken cell constructed under a stone sitting on soil or vegetation. Wandering specimens are restricted to the ground surface where they may be found at the base of grasses, amongst other vegetation, or in litter. The female sets and remains with an egg-sac in a silken cell until the spiderlings have hatched and dispersed. British records (Harvey *et al.*, 2002) show adults of both sexes occuring from May to September, being most abundant in May/June and appearing in smaller numbers later in the year.

D. pubescens is widespread in southern England and most abundant in the extreme south. It has a Palaearctic distribution (Platnick, 2007) and is found across

Europe, occurring throughout the Mediterranean, in European Russia, in the Scandinavian countries and across Central and Western Europe (Helsdingen, 2007).

Given the species' European distribution it is not surprising that it should also occur in Ireland. However, calcareous grassland of the type from which the present record was taken is a threatened habitat in Ireland. The site in question is potentially threatened by further encroachment of the already substantial stands of *Ulex* that occupy the uppermost areas of the esker (and which occur even more abundantly along that section of the esker in an easterly direction). Given that low-nutrient, sandy, well-drained soils would seem to constitute the species' preferred habitat in much of western Europe, it could be suggested that it may be actually uncommon or rare in Ireland. It might be expected to occur on sand-dune systems, especially perhaps in the southern half of the country, however this habitat also has suffered significantly from over-grazing and other management practices and abuses over the years. Only further survey effort in appropriate habitat would answer the question as to whether the species can be considered genuinely rare in Ireland or is simply under-recorded.

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FIRST RECORDS OF THREE SPIDER SPECIES IN IRELAND (ARANEAE): *GLYPHESIS COTTONAE* (LA TOUCHE), *MIOXENA BLANDA* (SIMON) (LINYPHIIDAE) AND *SEGESTRIA FLORENTINA* (ROSSI) (SEGESTRIIDAE)

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Introduction

The first records of three spiders in Ireland are detailed: two of these are presumed native, the third is of uncertain origin. None of these species are noted in Helsdingen (1996) or subsequent publications pertaining to the Irish spider fauna. *Glyphesis cottonae* (La Touche) was collected at All Saints Bog, Co. Offaly, a site of considerable interest due to the presence of substantial birch *Betula* woodland on the raised bog. *G. cottonae* may be an internationally threatened species and is one of a number of species in Britain for which a Biodiversity Action Plan is to be developed. *Mioxena blanda* (Simon) is considered rare in Britain and was collected in Ireland in 1980 on coastal dune in Co. Wexford, though the specimen was misidentified at the time. *Segestria florentina* (Rossi) is a species that has been quite frequently imported into Britain and has established colonies at a number of coastal and market towns. It is not known if it is established in Ireland and a number of possible origins for the specimen are discussed. All three species were identified using Roberts (1985; 1987).

Glyphesis cottonae (La Touche, 1945) (Linyphiidae)

One male and one female of this very small (1-1.1mm) linyphiid spider were caught in pitfall traps set in All Saints Bog, Co. Offaly (N0111). Traps (n= 10) were run over two periods; 25 April to 23 May (♂ taken) and 23 May to 12 June 2008 (♀ taken). The trapping forms part of an investigation of the spiders of this site carried out on foot of an award from the Heritage Council under the Wildlife

Grant Scheme 2008 (WLD/2008/16452). The site is a raised bog and active raised bog is a priority habitat under the EU Annex I habitats guide (European Commission, 1996). All Saints Bog is more remarkable in an Irish context however on account of the presence of a substantial area of birch *Betula* woodland on the bog. Bog woodland is priority habitat under the same directive. The woodland is of considerable age and has yielded previously a number of interesting invertebrate finds (O'Connor and Speight, 1987; Speight, 1990).

The traps were set in a flushed area of bog lying between the main area of woodland and a substantial copse of Scots pine *Pinus sylvestris*. The pine seems to have secondarily invaded the woodland and is now present in substantial amounts. The station is wet, with some open pools dominated by *Sphagnum cuspidatum* and moss hummocks formed by a variety of species (primarily *Sphagnum*). The hummocks are overgrown by heather *Calluna vulgaris* and hare's tail cotton grass *Eriophorum vaginatum* and a range of other typical bog species are also abundant including cross-leaved heath *Erica tetralix*, common sundew *Drosera rotundifolia*, bog rosemary *Andromeda polifolia* and cranberry *Vaccinium oxycoccus*. Less typical, both crowberry *Empetrum nigrum* – on hummocks – and royal fern *Osmunda regalis* are also locally abundant. Small and tallish (*circa* 1.5-2m) saplings of birch and pine (the latter more abundant) are also to be seen and a good number of dead saplings (killed by fire) are still standing in the vicinity.

Glyphesis cottonae had Nationally Scarce (Notable A) status in Britain (Harvey *et al*., 2002) where it is abundant in a small number of *Sphagnum* bogs associated with heathlands in Dorset, Hampshire and Surrey. Merrett (*in* Harvey *et al*., 2002) suggests the species has a preference for sturdy growth of *Sphagnum* above water level and this is echoed in All Saints Bog by the presence of *Sphagnum* hummocks at the trapping station. The loss of heathland and drainage of bog threaten the species in Britain and maintenance of a high water table is suggested as being important with respect to its conservation. In 2005, *G. cottonae* was one amongst a number of species selected for preliminary inclusion in a U.K. Biodiversity Action Plan for spiders (Russell-Smith and Harvey, 2005). Since then the original list was

subject to intensive scrutiny and this has resulted in the generation of a shorter list of species which still includes *G. cottonae* – given that it had undergone a marked decline in the U.K. – and, ministerial approval has recently been given for the development of a conservation plan for each of these species (Harvey and Russell-Smith, 2008). In a recent draft revision of the national status of spiders in Britain using I.U.C.N. standards, *G. cottonae* has been given Vulnerable status (Dawson *et al*., 2008).

Elsewhere in Europe the spider has been recorded in association with wet heathland and natural *Picea* forest (Hänggi *et al.,* 1995). It has a Palearctic distribution (Platnick, 2008) but is restricted in Europe where it occurs in Belgium, Finland, Germany, Kaliningrad (Russia), Poland and Sweden (Helsdingen, 2007). It has been recorded from Japan (Saito and Yasuda, 1990) but seems not as yet to have been recorded from other parts of Asia or Russia.

It is argued (Speight, 1990) that the birch woodland component of All Saints Bog represents a relict biotope in Ireland that may be of international interest and that this component also provides the most interesting cross-section of invertebrates from the site in general. The presence of *G. cottonae* certainly adds to the interest of the site and while the species does not have a strong association with forest habitats *per se*, the Irish specimens was found in relative proximity to the woodland. The continuous presence of the forest over an extended period would suggest an absence of significant grazing over the same time-frame and would have served to discourage extraction of peat. Its presence as a deterrent to exploitation may have helped protect other components of the bog as a whole, and offer habitat continuity for a range of plant and animal species. The north-east section of All Saints Bog has been subject to extensive drainage and mechanical harvesting of peat, and while this has now stopped, the process seems to have caused significant drainage from the area of remaining high bog where little open/*Sphagnum* dominated pools or hummock/hollow development was evident to the author on a significant number of visits through 2008 (>10 days). Continued lowering of the water table within the bog may adversely affect the population of

G. cottonae.

G. cottonae is most usually found between September and May but more frequently from October to February. The specimens from All Saints Bog are thus perhaps late appearing in the species' season and may evidence the presence of a substantial local population. Collecting from the site at a more appropriate time of year would be necessary to answer this question.

***Mioxena blanda* (Simon, 1884) (Linyphiidae)**

A single male specimen of this very small species (1.5-2mm) was found in a collection of spiders held in the Natural History Division of the National Museum of Ireland. This collection was made by Lesley Gibson between 1979 and 1982 at Carnsore Point, Co. Wexford and a list of species recorded, based on a brief examination of the collection, was published previously (Nolan, 2000). In 2006, the National Biodiversity Data Centre, Co. Waterford, commissioned the author to verify identifications and digitise information pertaining to the collection and it was during this process that the specimen of *M. blanda* was identified. It had been originally misidentified as *Lepthyphantes ericaeus* (Blackwall, 1853) (Linyphiidae). In Britain, the species has Nationally Scarce (Notable B) status and is considered rare. It was felt that prior to the species' inclusion in a U.K. Biodiversity Action Plan, its status should be further investigated (Russell-Smith and Harvey, 2005). But since then, it has been given Endangered status under I.U.C.N. guidelines (Dawson *et al*., 2008).

The Irish specimen was collected in a pitfall trap set between 26 October and 9 November 1980 at Pullinstown Burrow, Carnsore Point, Co. Wexford T114039. The trap was set in fixed yellow-dunes on the south-coast, amongst vegetation dominated by marram *Ammophila arenaria*, burnet rose *Rosa spinosissima*, creeping red fescue *Festuca rubra*, the bent grass *Agrostis stolonifera*, lady's bedstraw *Galium verum*, bracken *Pteridium aquilinum* and other mixed grass species. The species' occurrence in this habitat agrees with some records from other countries. The spider is most usually recorded from disturbed or cultivated habitats: cereal and oilseed fields; vineyards; surfaces of spoil heaps (Hänggi *et*

al., 1995). The greater abundance of records from natural and semi-natural habitats are from oligotrophic grasslands, fallow and cultivated meadows, and to a lesser extent from forest types including alder *Alnus*, birch, and mixed oak/birch. It has been found in dense stands of *Ammophila* in Denmark (Boggild, 1975). British records are from an essentially similar range of habitats but also include saltmarsh, pine litter and riparian gravels (Harvey *et al*. 2002). Thornhill (1980) has collected it in pitfall traps set in arable fields between autumn and spring.

It is suggested that its preferred habitat is subterranean (Harvey *et al*. 2002) (there is a record from inside a tin mine (Cowden, 1983)) but this broad suggestion is made on the basis of no preferred habitat having been supposedly observed in Britain. The species does seem however to prefer habitats subject to a fairly high degree of disturbance – with a thin vegetative sward or significant amounts of exposed soils. This being the case and knowing that it occurs on spoil heaps associated with mining, a record from inside a mine is perhaps not as unexpected as it may seem and does not necessarily suggest it is preferentially subterranean. At microsite level the spider is found within litter, deep amongst tussocky grasses at ground level, amongst gravels or piles of stones subject to disturbance.

Both sexes are recorded from August through to January, the majority appearing from October to December (Harvey *et al*., 2002) and the Irish record fits this pattern. The fact of the species being mature during winter can at least partially account for its not having been noted previously from Ireland, since little collecting is generally carried out during this time of year.

M. blanda is widely scattered through southern Britain (there are no records from Scotland) though there are few records, most of these from southern England (Harvey *et al*. 2002). It is limited in distribution to Europe and Russia and has a northern distribution in this region, occurring throughout Scandinavia but not recorded from much of the Mediterranean including Spain, Portugal and Greece (Helsdingen, 2007).

Assessing the occurrence and abundance of such a small species is not easy. In this case, collecting from tilled cereal/arable fields in the south-east of Ireland

during the later autumn and winter months would perhaps be the most efficient way of demonstrating the species' presence and distribution, though this obviously does not target the natural or semi-natural habitats that may be of conservation priority.

***Segestria florentina* (Rossi, 1790) (Segestriidae)**

A single female specimen of this species was collected in a large food retail store in the city centre of Dublin O1533 around September 2005 by an employee, who brought the spider to the Natural History Museum, Dublin in early October of the same year. The specimen supposedly emerged from a box of Fyffes bananas which he had opened one morning. This box had been sitting on a pallet of various fruits and vegetables which had been left at the store in the early hours of the morning.

S. florentina is significantly larger than *S. senoculata* L. 1758, the other species of *Segestria* found in Ireland. A third species, *S. bavarica* C. L. Koch, 1843 occurs in Britain but has not yet been recorded from Ireland. The single female of *S. florentina* seen by the author measures 20mm in length (about twice the size of a large female of *S. senoculata*) from the tip of the prognathous chelicerae to the rear of the abdomen. Legs I and II are long, robust, dark and quite hairy. The specimen has a very dark abdomen and lacks the distinctive dorsal pattern seen in the common species (males of *S. florentina* apparently have a more distinct pattern). It was readily identified by the ventral spination on metatarsus I and by the large chelicerae which under direct light have a striking metallic green sheen. Immatures of *S. florentina* may be identified on the basis of the same characters.

In behaviour *S. florentina* is typical of the genus, establishing a retreat in a crack or crevice which it lines lightly with silk. The spider then extends silken tripwires from the mouth of the retreat in a radial pattern. Potential prey crossing these lines trigger an attack by the occupant. The presence of such lines at the mouth of a retreat is diagnostic of the genus in Ireland and Britain and webs of large specimens of *S. florentina* would have a noticeably large opening.

The species originally was limited in distribution to Europe, having its base in

the Mediterranean region, however since it spreads *via* port towns, it is now found further afield in Europe (Helsdingen, 2007; Platnick, 2008). The collector of the specimen in question felt quite certain that the spider came from within the box of bananas and it seemed worthwhile to trace the path taken by such a box. To this end Fyffes, Ireland, was contacted and the following information pertaining to the importation and distribution of bananas was obtained. Import and distribution practices have changed significantly even since the end of 2005, notably as a consequence of the rise of the mutiples who have taken over many of the services once offered by a company such as Fyffes – so the information contained herein pertains to the practice at the end of 2005. It must be stressed that while the present note mentions Fyffes there is no implication that Fyffes is more likely to accidentally introduce specimens than any other importer or is any less vigilant with respect to the observation of the regulations governing the import of goods or foodstuffs.

The procedure whereby bananas were at the time imported may be briefly summarised: the fruit was boxed at the point of origin (a proportion of it also being bagged in small amounts depending on the placed orders), then loaded and shipped. At that time, Ireland was the first port of call for all of Fyffes European fruit imports from Central and South America (as many as eleven countries). Shipping took place under temperature controlled conditions, the fruit being maintained at 13.6^{o} Celsius to temporarily stall the ripening process. Unloading occurred at the port of Foynes, Co. Limerick, and boxes were brought to ripening plants all over Ireland where they were stored again at a temperature of 13.6^{o}C. Depending on local sales/demands, batches of fruit would be exposed to a very small amount of ethylene gas at a temperature of approximately 18°C for three to four hours in order to re-activate the ripening process. After a few days, they would be ready for distribution to retail outlets countrywide. Other companies at that time imported bananas into Ireland *via* England or Continental Europe, whence they were trucked in *via* roll-on-roll-off facilities.

This information does not however satisfactorily answer the question of the

specimen's origin. The fact that *S. florentina* is a European species weighs strongly against a South American origin (unless it is shown to have already established itself there) despite its being clear that a stowaway specimen could potentially quite easily survive the above procedures – temperatures not being so low as to be life threatening. Other fruits e.g. grapes, are imported from Mediterranean countries by Fyffes, and it is certainly more plausible that the specimen's presence in the banana box could have been a consequence of cross-contamination – holes on the side of the boxes to allow for handling would grant a spider easy access; and an essentially nocturnal species such as *S. florentina* could be drawn to the dark interior. A third possibility however is that the specimen originated from a population already established in Ireland and had no association with the fruit until the shipment arrived in the country. Since however no established population of *S. florentina* has been found here, the actual origin of the specimen must remain speculative. As such the record should perhaps be considered an observation of an imported species that one could fairly reasonably expect to see established in Ireland. This note may assist in the identification of colonies if they exist.

In Britain, *S. florentina* is known from a fairly large number of sites at ports and market towns in the very south of England, and is spreading. According to Helsdingen (2007), *S. florentina* occurs primarily throughout the Mediterranean but has been recorded from Germany and the Netherlands. It occurs in Europe as far east as Georgia (former U.S.S.R.) (Platnick, 2007).

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ARTHROPOD BIODIVERSITY OF AGRICULTURAL GRASSLAND IN SOUTH AND EAST IRELAND: INTRODUCTION, SAMPLING SITES AND ARANEAE

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Abstract

Between 2002 and 2006, the Ag-Biota Project was funded by the Irish EPA to explore the biodiversity of moderate to intensively managed lowland agricultural grasslands in Ireland. As part of this work grassland arthropods were sampled from 64 sites, using several different collection techniques. A summary is given of the Araneae collected from Irish lowland agricultural grasslands by the Ag-Biota Project between 2002 and 2006. Seventy species of spiders were collected from the 64 sampling sites across 10 counties in South East Ireland. Of these, 35 species were found to be new records at county level, with 15 new county records for Co. Meath alone. The species collected are listed, together with details of the sites where they were found and an indication of their overall relative abundance.

Introduction

The agricultural landscape of Ireland is dominated by grassland. The Department of Agriculture Fisheries and Food's statistics indicate that of Ireland's five million hectares of agricultural land, 80% is covered by grassland used for silage, hay or pasture, with a further 11% under rough grazing (Anon., 2008).

Agricultural grasslands therefore represent a very significant area of habitat but one which remains little explored with regard to its biodiversity.

From 2002 to 2005, the Irish Environmental Protection Agency (EPA) funded the Ag-Biota Project, to investigate various aspects of the biodiversity of Irish agricultural grasslands. It included a range of studies on habitats, vegetation, birds, 'aesthetic' insects such as butterflies and bees, other terrestrial arthropods, earthworms and freshwater invertebrates, and a range of ecological studies of the functional value of biodiversity in agroecosystems (Purvis *et al*., 2005).

Studies of grassland arthropod populations formed a major component of the Ag-Biota Project and a wide range of Irish agricultural grasslands were sampled for arthropods between 2002 and 2006. It is this work that is the focus here in a short series of papers that list the arthropods collected. This paper is a brief introduction to the grassland arthropod work as a whole and also gives details of the Araneae collected. Three subsequent papers give details of the species collected from the Coleoptera, Hemiptera and parasitic Hymenoptera.

Arthropods were collected from a total of 64 sites (Fig. 1), using four different sampling techniques: suction sampling, pitfall trapping, sweep netting and extraction from turfs cut from grass tussocks. Sample collection was part of several different monitoring studies and so not all techniques were employed at all sites. Suction sampling was done at all sites, pitfall trapping at 11 sites and turf extraction at 10, with sweep netting used only at a single location. Although suction sampling was used ubiquitously, the number of samples and therefore the area sampled, differed between locations. Similarly sites were not all sampled at the same time in the same year or years. Given the variation in sampling, we do not seek to provide information allowing a rigorous comparison of grassland invertebrates between sites. Rather in this series of papers, we seek to provide an overview of the diversity of arthropod communities in Irish agricultural grasslands, giving a picture of the numerically important species, and so contribute to knowledge of Irish invertebrate biogeography.

Site details

The initial work on grassland arthropods focused at ten sites (Action 1) in south and east Ireland (Fig. 1 and Table 1). Two of these sites were located in very close proximity at the University College Dublin (UCD) Research Farm at Lyons Estate, Co. Kildare, and therefore their location in Figure 1 is given by two strongly overlapping symbols. Sampling at the initial ten sites was conducted in 2002 and 2003 (Table 1). A second phase of sampling, in general terms referred to as 'Action 2', was carried out at various agronomic experiments in close proximity to four of the initial sampling sites at the Teagasc Research Centres of: Johnstown Castle, Co. Wexford; Grange, Co. Meath; Solohead, Co. Tipperary and at the UCD Research Farm, Lyons Estate (Table 2). Details of sampling dates and methods for Action 2 are given in Table 3. A more extensive survey of 50 commercial farms, selected randomly from the National Farm Survey Database, was restricted to 2005. Details of these sites are given in Table 4.

Sampling techniques

Suction sampling was carried out using a Vortis suction sampler (Burkard Manufacturing Co Ltd, Rickmansworth, Hertfordshire, UK) (Arnold, 1994). At each sampling site a number of samples were collected, each of which was the result of placing the sampler on the ground vegetation for several ten second sucks at different sampling points. The cross sectional area of the suction sampler was $0.02m^2$. Tables 1, 3 and 4 provide details of the total area sampled at each site.

Pitfall trapping was carried out using clear plastic cups, 8cm in diameter and 11cm deep, which were inserted into a short piece of plastic drainpipe, of the same diameter, sunk into the ground. The traps were partially filled with a mixture of water and detergent. Traps were emptied after two weeks and the same catching procedure was repeated twice in each sampling season. In all cases two sampling seasons were carried out at each site. The figures given in Tables 1 and 3 indicate the total number of samples collected over six sampling occasions.

The grass tussock turfs were collected during January and February 2003, with

ten taken from each site. A 25 x 25cm quadrat was placed over a randomly chosen tussock and the vegetation and top 5cm of soil removed using a flat spade. In the lab, each section of turf was cut into four sections and placed in a bowl extractor for 7 days, followed by hand sorting of the turf/soil. The bowl extractor was made from two 32cm diameter washing-up bowls, with one inserted inside the other. The upper bowl had a 12 x 12cm square hole cut from the base, on top of which was placed a section of plastic grill with 9mm diameter aperture width. The lower bowl was filled with approximately 2.0cm of water and a little detergent, and the upper bowl was held clear of this solution by a platform made from four crossed 23cm dowel rods. The four sections of turf were placed inside the upper bowl, which was then covered with fine nylon mesh, and the whole apparatus was placed underneath a light bank of six 58W fluorescent tubes. Arthropods emerging from the turf were caught in the solution, from where they were collected.

Sweep netting was only performed at one site, where it was used to sample the replicated plots of a grassland field margin experiment at Teagasc Johnstown Castle. Each sample comprised eight 'figure of eight' sweeping movements of the net through the vegetation.

Spiders were collected by suction sampling at all sites, tussock sampling at the Action 1 sites, sweep netting at Johnstown Castle field margin experiment (JC_{fm}), Co. Wexford and additionally using pitfall traps at Lyons Estate and Oak Park Commercial, Co. Kildare; Johnstown Castle and Johnstown Castle commercial, Co. Wexford, Solohead and Solohead commercial, Co. Tipperary; Oak Park, Co. Carlow; Grange and Grange commercial, Co. Meath. Species identifications were made using Roberts (1985, 1987) and Locket and Milledge (1951, 1953). New county records were determined using an updated list provided by Myles Nolan.

Results:

A total of 29,319 individuals representing 70 species of spider from eight families were recorded from the 64 sites sampled in ten different counties during the Ag-Biota project. The Linyphiidae were by far the most common family

collected, followed by the Lycosidae. The total numbers of individuals found in each county, together with details of the locations in which they were recorded is listed for each species.

The most abundant and common species collected were *Bathyphantes gracilis*, *Erigone atra*, *E. dentipalpis*, *Lepthyphantes tenuis* and *Oedothorax fuscus* and all were found in all the counties sampled.

The following list shows the 70 species of spider collected, the county they were collected from, the total number of individuals collected from that county (in bold), and details of the sites in which they were found in parentheses. Details of abbreviations used may be found in Tables 1, 2 and 4. At most sites, only suction sampling was used. If more than one sampling method was used at a site, additional information is given concerning the sampling type: suction (suc), sweep (sw) and pifall (pit). Thirty-five species were found to be new records at the county level. New county records are indicated with an asterisk * and a summary list of these records is provided in Appendix 1.

Araneidae

Araniella cucurbitina (Clerck): Wexford **3** (JC_{fm}_sw).

Linyphiidae

Agyneta decora (O. P.-Cambridge): Carlow **1** (OPC_pit); *Kilkenny **1** (45); *Meath **3** (21); Wicklow **4** (10, 27).

Agyneta subtilis (O. P.-Cambridge): Wexford **3** (JC_{to}-pit, JCC_pit).

Araeoncus humilis (Blackwall): Waterford **1** (46); Wexford **8** (36, JC_pit, JC_{co}).

Baryphyma trifons (O. P.-Cambridge): Wexford **11** ($JC_{co,}$ JC_{fm}_suc_sw, JC_{to} _suc_pit).

Bathyphantes gracilis (Blackwall): Carlow **198** (5, 23, 47, OP_suc_pit, OPC_suc_pit); Cork **322** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **235** (L_suc_pit); Kilkenny **81** (6, 24, 44, 45); Laois **6** (7); Meath **232** (3, 4, 18, 19, 20, 21, 22, 50, GR_suc_pit, GRC_suc_pit); Tipperary **224** (SH_suc_pit, SHC_suc_pit); Waterford **196** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **1129**

(1, 2, 8, 9, 36, 37, 38, 39, 48, JC_suc_pit, JC_{fm}, JC_{co}, JC_{to}_suc_pit, JCC); Wicklow **116** (10, 25, 26, 27).

Bathyphantes parvulus (Westring): Cork **2** (15); Wexford **63** (1, 8, JC_ suct_pit).

Centromerita bicolour (Blackwall): Carlow **2** (OPC_suc_pit); *Kildare **5** (L_suc_pit); Tipperary **2** (SH_pit, SHC-pit); Wexford **8** (JC_pit, JC_{fm}).

Ceratinella brevipes (Westring): *Meath **1** (21).

Ceratinella scabrosa (O. P.-Cambridge): *Kildare **1** (L_pit).

Dicymbium nigrum (Blackwall): Carlow **10** (OP_pit, OPC_pit); *Kildare **11** (L_suc_pit); Meath **18** (GRC_suc_pit); Tipperary **3** (SH_pit, SHC_pit); *Waterford **1** (17); Wexford **108** (1, JC_suc_pit); Wicklow **6** (10, 27).

Dicymbium tibiale (Blackwall): Carlow **1** (OP_pit); *Kildare **2** (L_suc_pit); *Wexford **3** (JC_pit, JC_{co}, JC_{fm}).

Diplocephalus latifrons (O. P.-Cambridge): Kildare (L_pit); *Meath **1** (4); *Wexford **1** (JC_{fm}_suc).

Dismodicus bifrons (Blackwall): Cork **3** (29); Kilkenny **1** (44); Wexford **7** (39; $JC_{co}JC_{fm}$_suc).

Erigone atra Blackwall: Carlow **493** (5, 23, 47, OP_suc_pit, OPC_suc_pit); Cork **662** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **633** (L_suc_pit); Kilkenny **156** (6, 24, 44, 45); Laois **14** (7); Meath **806** (3, 4, 18, 19, 20, 21, 22, 50, GR_suc_pit, GRC_suc_pit); Tipperary **879** (SH_suc_pit, SHC_suc_pit); Waterford **357** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **2133** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC_suc_pit, JC_{co}, JC_{fm}, JC_{to}_suc_pit, JCC); Wicklow **120** (10, 25, 26, 27).

Erigone dentipalpis (Wider): Carlow **470** (5, 23, 47, OP_suc_pit, OPC_suc_pit); Cork **196** (11, 12, 13, 14, 15, 28, 29, 31, 32, 33); Kildare **579** (L_suc_pit); *Kilkenny **89** (6, 24, 44, 45); *Laois **10** (7); Meath **584** (3, 4, 18, 19, 20, 21, 22, 50, GR_suc_pit, GRC_suc_pit); Tipperary **614** (SH_suc_pit, SHC_suc_pit); Waterford **80** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **1061** (1, 2, 8, 9, 36, 37, 38, 39, 48, JC_suc_sw_pit,JC_{co}, JC_{fm}, JC_{to}_suc_pit, JCC); *Wicklow **32** (10, 25, 26, 27).

Erigone longipalpis (Sundevall): Tipperary **1** (SH_suc).

Erigonella hiemalis (Blackwall): Carlow **3** (47); *Meath **2** (22, 50); Wexford **2** (JC_pit).

Gnathonarium dentatum (Wider): Tipperary **1** (SH_pit); Wexford **2** (JC_{to}_pit).

Gongylidiellum vivum (O. P.-Cambridge): Carlow **1** (47); *Kildare **6** (L_pit); *Meath **3** (22, GR_pit, GRC_pit); Tipperary **4** (SH_suc); Wexford **20** (8, JC_{co}, JC_{fm}_suc, JC_pit, JC_{to}_pit, JCC_pit).

Hypomma bituberculatum (Wider): Kildare **1** (L_pit); Meath **1** (18); Wexford **22** ($JC_{to, fm}$_suc, JC_pit, JC_{to}_pit).

Hypomma cornuatum (Blackwall): Wexford **1** (JC_sw).

Kaestneria pullata (O.P.-Cambridge): Wicklow **1** (25).

Lepthyphantes ericaeus (Blackwall): Cork **1** (31); Kildare **2** (L_suc); *Kilkenny **2** (6, 44); *Meath **2** (18, 50); Waterford **2** (16, 46); Wexford **290** (36, 37, 38, 48, JC_{to}_suc_pit, $JC_{co, fm}$_suc).

Lepthyphantes insignis O. P.-Cambridge: *Wexford **1** (JC_suc).

Lepthyphantes mengei Kulczynski: Wexford **1** (JC_{co}_suc).

Lepthyphantes obscurus (Blackwall): Wexford **1** (JC_sw)

Lepthyphantes tenebricola (Wider): Wexford **1** (JC_{fm}_suc).

Lepthyphantes tenuis (Blackwall): Carlow **147** (5, 23, 47, OP_suc_pit, OPC_suc_pit); Cork **170** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **163** (L_suc_pit); Kilkenny **46** (6, 24, 44, 45); Laois **5** (7); Meath **183** (3, 4, 18, 19, 20, 21, 22, 50, GR_suc_pit, GRC_suc_pit); Tipperary **103** (SH_suc_pit, SHC_suc_pit); Waterford **109** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **574** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC_suc_sw_pit, JC_{co}, JC_{fm}, JC_{to}_suc_pit, JCC); Wicklow **45** (10, 2, 24, 9).

Lepthyphantes zimmermanni Bertkau: Kildare **2** (L_suc).

Leptorhoptrum robustum (Westring): Carlow **49** (47, OP_suc_pit, OPC _suc_pit); *Cork **2** (32); Kildare **25** (L_pit); *Meath **17** (GR_pit, GRC_pit); Tipperary **118** (SH_suc_pit, SHC_suc_pit); *Waterford **1** (17); *Wexford **43** (JC_pit, JC_{to}_suc_pit, JC_{fm}, JCC_pit); Wicklow **1** (27).

Maso sundevalli (Westring): Wexford **1** (JC_{fm}_suc).

Meioneta rurestris (C. L. Koch): Carlow **1** (5): *Cork **3** (11, 15, 33); Kildare **5** (L_suc); *Kilkenny **1** (45); *Meath **2** (3, 20); *Waterford **1** (42); *Wexford **1** (9); *Wicklow **1** (26).

Micrargus herbigradus (Blackwall): *Kildare **2** (L_pit).

Micrargus subaequalis (Sundevall): Carlow **1** (47); Kildare **5** (L_pit); Wexford **42** (1, 8, 37, 49, JC_suc_sw_pit); *Wicklow **1** (26).

Microlinyphia pusilla (Sundevall): Wexford **1** (JC_{fm}_suc).

Monocephalus fuscipes (Blackwall): Carlow **1** (OP_pit); Cork **1** (33); Kilkenny **1** (44).

Neriene montana (Clerck): Wexford **1** (JC_{fm}_suc).

Oedothorax apicatus (Blackwall): *Wexford **1** (8).

Oedothorax fuscus (Blackwall): Carlow **865** (5, 23, 47, OP_suc_pit, OPC_suc_pit); Cork **232** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **440** (L_suc_pit); Kilkenny **84** (6, 24, 44, 45); *Laois **8** (7); Meath **582** (3, 4, 18, 19, 20, 21, 22, 50, GR_suc_pit, GRC_suc_pit); Tipperary **795** (SH_suc_pit, SHC_suc_pit); Waterford **195** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **3925** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC_suc_pit, JC_{co}, JC_{fm},JC_{to}_suc_pit); *Wicklow **109** (10, 25, 26, 27).

Oedothorax retusus (Blackwall): Carlow **7** (47, OP_suc_pit, OPC_suc_pit); Cork **2** (15, 33); *Kildare **3** (L_pit); Kilkenny **3** (44, 45); Tipperary **3** (SH_pit, SHC_pit); *Waterford **9** (34, 35, 40, 46); Wexford **139** (2, 36, 37, 39, JC_suc_pit, JC_{co}, JC_{fm}, JC_{to}_suc_pit); Wicklow **2** (10, 27).

Ostearius melanopygius (O. P.-Cambridge): Kildare **1** (L_pit); *Kilkenny **1** (44); *Meath **1** (GRC_pit); Wexford **2** (JC_pit, JCC_pit).

Pelecopsis parallela (Wider): *Wexford **1** (JC_{fm}_suc).

Pepnocranium ludicrum (O. P.-Cambridge): Cork **1** (28); *Waterford **1** (40).

Pocadicnemis juncea Locket and Millidge: Tipperary **1** (SH_pit); *Wexford **3** (JC_pit).

Pocadicnemis pumila (Blackwall): Wexford **19** ($JC_{co}JC_{fm}$_suc, JC_{to}suc_pit).

Porrhomma pygmaeum (Blackwall): Kildare **1** (L_suc); Kilkenny **2** (6); Waterford **1** (41); Wexford **3** (36, $JC_{to,\ fm}$_suc).

Savignia frontata Blackwall: Carlow **8** (47, OP_suc_pit, OPC_suc_pit); Cork **7** (11, 13, 28, 29, 30, 31, 32, 33); Kildare **19** (L_suc_pit); Kilkenny **4** (24, 44, 45); Meath **22** (18, 22, 50, GR_pit, GRC_suc_pit); Tipperary **5** (SH_pit, SHC-pit); Waterford **6** (35, 40, 43); Wexford **62** (8, 37, 39, 48, 49, $JC_{co,\ fm,}$_suc, JC_pit, JC_{to}_suc_pit, JCC_pit); *Wicklow **8** (10, 25, 26).

Silometopus elegans (O. P.-Cambridge): *Waterford **1** (16).

Silometopus reussi Thorell: *Kildare **1** (L_pit); *Wexford **2** (36, JCC_pit).

Taranucnus setosus (O. P.-Cambridge): Wexford **1** (JC_{to}_pit).

Tiso vagans (Blackwall): Wexford **1** (JC_{fm}_suc).

Troxochrus scabriculus (Westring): Carlow **1** (47); Wexford **1** (JCC_pit).

Walckenaeria unicornis O. P.-Cambridge: Wexford **1** (JC_{to}_pit).

Walckenaeria vigilax (Blackwall): Wexford **4** (JC_{fm}_suc, JC_{to}_pit).

Lycosidae

Alopecosa pulverulenta (Clerck): Carlow **2** (OP_pit); Kildare **2** (L_pit); *Meath **2** (GR_pit); Wexford **1** (JCC_pit).

Pardosa amentata (Clerck): Carlow **2** (OP_pit); Kildare **1** (L_pit); *Meath **2** (GR_pit, GRC_pit); Tipperary **11** (SH_pit, SHC_pit); Wexford **94** (JC_pit, JC_{to}_pit, JCC_pit).

Pardosa nigriceps (Thorell): Wexford **9** (JC_{to}_pit).

Pardosa palustris (Linnaeus): Carlow **2** (OP_pit); Cork **1** (28); *Kildare **6** (L_pit); *Meath **10** (GR_pit, GRC_pit); Tipperary **11** (SH_pit, SHC_pit); Wexford **5295** (JC_pit, JC_{to}_suc_pit, JCC_pit); Wicklow **1** (10).

Pardosa pullata (Clerck): Carlow **7** (OP_pit); Kildare **5** (L_pit); *Meath **4** (GR_pit, GRC-pit); Tipperary **5** (SH_pit, SHC_pit); Wexford **459** (JC_{fm}_suc, JC_pit, JC_{to}_suc_pit, JCC_pit).

Pirata piraticus (Clerck): Wexford **3** (JC_{to}_pit).

Trochosa ruricola (Degeer): Carlow **2** (OP_pit, POC_pit); *Meath **1** (GRC _pit); Tipperary **1** (SH_pit); Wexford **23** (JC_pit, JC_{to}_pit, JCC_pit).

Mimetidae

Ero cambridgei Kulczynski: *Wicklow **1** (27).

Philodromidae

Tibellus oblongus (Walckenaer): *Cork **1** (30).

Tetragnathidae

Pachygnatha clercki Sundevall: Cork **1** (28); Meath **1** (GRC_pit); Wexford **7** (JC_{to}_suc); Wicklow **1** (25).

Pachygnatha degeeri Sundevall: Carlow **18** (23, OP_pit, OPC_pit); Kildare **55** (L_suc_pit); Kilkenny **3** (44); *Meath **24** (4, 21, GR_suc__pit, GRC-pit); Tipperary **17** (SH_suc_pit, SHC_pit); Waterford **6** (35, 41, 43); Wexford **309** (2, JC_suc_pit, JC_{co}, JC_{fm}_suc_sw, JC_{to}_suc_pit, JCC_suc_pit); Wicklow **7** (10, 26, 27).

Theridiidae

Enoplognatha ovata (Clerck): Carlow **2** (2); Kilkenny **1** (24); Wexford **4** (JC_{fm} _suc_sw); Wicklow **1** (10, 27).

Paidiscura pallens (Blackwall): Wexford **1** (JC_{fm}_sw).

Robertus neglectus (O. P.-Cambridge): *Kildare **1** (L_suc).

Thomisidae

Xysticus cristatus (Clerck): Wexford **21** (JC_{to}_pit)

Discussion:

The vast majority of these spiders are relatively common species. The most abundant species collected were *B. gracilis*, *E. atra*, *E. dentipalpis*, *L. tenuis* and *O. fuscus*. These species were found at all sites sampled and are typically associated with disturbed or highly managed agricultural sites and species poor grassland (Cameron *et al*., 2004; Rushton *et al*., 1987; Rushton and Eyre, 1989, 1992). Species such as *T. vagans*, *X. cristatus* and *A. pulverulenta* were less frequently collected and are species more typically associated with species-rich grasslands (Cameron *et al*., 2004) as opposed to the agricultural grasslands sampled in this study.

Three new county records were found for Cork; 10 for Kildare, 5 for Kilkenny, 2 for Laois, 15 for Meath, 6 for Waterford, 9 for Wexford and 6 for Wicklow. The relatively high incidence of new records, at least in part, reflects the lack of previous study, as these new county records include many common species typically associated with agricultural grassland, including *E. dentipalpis* and *O. fuscus*. The vast majority of the new county records are from the Family Linyphiidae which reflects the high relative abundance of this family in our samples. Gibson *et al*. (1992) also found that Linyphiidae were common and widespread in grazed habitats. This study shows the diversity of spiders which can occur in agricultural grassland habitats of south-east Ireland.

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TABLE 1. Details of the ten sites sampled in the initial (Action 1) grassland arthropod biodiversity surveys in 2002 and 2003. At all sites suction samples from an area of ($0.6m^2$) were collected in August 2002, 30 pitfall samples in September/October 2002 and again in May/June 2003 and ten tussock turf samples were taken in January 2003. Grid references are not given for the commercial farms to maintain farmer confidentiality

Name	**Farm type**	**County**	**Grid ref.**
Johstown Castle Teagasc (JC)	Dairy and cattle	Wexford	T026166
Johstown Castle commercial (JCC)	Dairy	Wexford	-
Solohead Teagasc (SH)	Dairy	Tipperary	R8651
Solohead commercial (SHC)	Dairy	Tipperary	-
Oak Park Teagasc (OP)	Cattle	Carlow	S731902
Oak Park commercial (OPC)	Cattle	Kildare	-
Grange Teagasc (GR)	Cattle	Meath	N8853
Grange commercial (GC)	Cattle and sheep	Meath	-
Lyons Dairy (LD)	Dairy	Kildare	N976283
Lyons Hill (LH)	Cattle and sheep	Kildare	N976287

TABLE 2. Details of agronomic experiments sampled during Action 2 during 2003, 2004 and 2005.

Experimental farm	**Sample site**	**Farm type**	**Grid ref.**
Johnstown Castle	COST 852 (JC_{co})	Experimental grassland	T023167
Teagasc	Field margins (JC_{fm})	Field margins around dairy paddocks	T022172
	Tower field (JC_{tf})	Cattle	T015174
Solohead Teagasc	(SH)	Dairy	M8651
Grange Teagasc	(GR)	Cattle	N8853
Lyons Estate	Lyons rotation (LR)	Arable/grass rotation	N9729

TABLE 3. Sampling methods and dates for the agronomic experiments (Action 2). For suction sampling area sampled is given. The number of samples is given for pitfall and sweep net samples.

Site	**Sampling and date**
JC_{co}	Suction: May and Aug 2004 ($4.8m^2$); June and Aug 2005 ($4.8m^2$)
JC_{fm}	Suction: June 2004 ($9m^2$); Aug 2004 ($9m^2$); June 2005 ($16.2m^2$); Aug 2005 ($16.2m^2$)
	Sweep: June 2004 (27); Aug 2004 (27)
JC_{tf}	Suction: May ($5.76m^2$) and July/Aug 2004 ($5.76m^2$)
	Pitfall: May/June 2004 (216); Sept/Oct 2004 (216)
SH	Suction: Aug 2003 ($3m^2$)
GR	Suction: Aug 2003 ($4.8m^2$); June 2005 ($9.6m^2$); Aug 2005 ($9.6m^2$)
LR	Suction: Aug 2002 ($12m^2$); Aug 2003 ($24m^2$)

TABLE 4. The details of sites suction sampled during the extended commercial farm survey in 2005. At all sites an area of 2.4m^2 was sampled, with an additional 0.6m^2 at the sites marked with an asterisk.

Name	Farm type	County	Grid reference	Date
Site 1*	Cattle and sheep	Wexford	30 13	6.7.05
Site 2*	Dairy and cattle	Wexford	31 15	6.7.05
Site 3*	Cattle and sheep	Meath	27 29	7.7.05
Site 4*	Dairy, cattle and sheep	Meath	28 28	7.7.05
Site 5*	Dairy and cattle	Carlow	27 16	8.7.05
Site 6*	Dairy and cattle	Kilkenny	25 26	8.7.05
Site 7	Cattle and Sheep	Laois	26 18	8.7.05
Site 8*	Cattle and Sheep	Wexford	31 14	11.7.05
Site 9*	Dairy, cattle and sheep	Wexford	31 16	11.7.05
Site 10*	Dairy and cattle	Wicklow	32 17	11.7.05
Site 11*	Cattle	Cork	17 10	12.7.05
Site 12*	Dairy and cattle	Cork	17 11	12.7.05
Site 13	Dairy and cattle	Cork	14 06	13.7.05
Site 14	Dairy and cattle	Cork	17 06	13.7.05
Site 15	Dairy and cattle	Cork	18 06	13.7.05
Site 16*	Dairy and cattle	Waterford	22 08	14.7.05
Site 17*	Cattle (Suckler)	Waterford	22 09	14.7.05
Site 18*	Cattle and sheep	Meath	31 26	18.7.05
Site 19*	Dairy and cattle	Meath	28 28	18.7.05
Site 20	Dairy and cattle	Meath	28 28	18.7.05
Site 21	Cattle and sheep	Meath	28 28	19.7.05
Site 22*	Dairy and cattle	Meath	25 28	19.7.05
Site 23	Cattle and sheep	Carlow	27 13	20.7.05
Site 24*	Cattle and sheep	Kilkenny	27 14	20.7.05
Site 25	Sheep	Wicklow	32 29	21.7.05

Site 26*	Cattle and sheep	Wicklow	29 16	21.7.05
Site 27*	Dairy and cattle	Wicklow	31 15	21.7.05
Site 28*	Dairy and cattle	Cork	18 11	25.7.05
Site 29	Dairy and cattle	Cork	17 11	25.7.05
Site 30	Dairy and cattle	Cork	15 09	26.7.05
Site 31*	Dairy and cattle	Cork	15 10	26.7.05
Site 32	Dairy and cattle	Cork	18 09	26.7.05
	Dairy, cattle and			27.7.05
Site 33*	sheep	Cork	20 07	
Site 34*	Dairy and cattle	Waterford	22 08	27.7.05
Site 35	Sheep and horses	Waterford	23 10	27.7.05
Site 36*	Dairy and cattle	Wexford	27 10	2.8.05
Site 37*	Dairy and cattle	Wexford	27 10	2.8.05
Site 38	Dairy and cattle	Wexford	28 11	2.8.05
Site 39*	Dairy and cattle	Wexford	28 11	3.8.05
Site 40	Dairy and cattle	Waterford	26 10	3.8.05
Site 41	Dairy and cattle	Waterford	25 10	3.8.05
Site 42	Dairy and cattle	Waterford	23 10	4.8.08
Site 43	Cattle	Waterford	23 10	4.8.05
	Dairy, cattle and			8.8.05
Site 44	sheep	Kilkenny	24 17	
	Dairy, cattle and			8.8.05
Site 45	sheep	Kilkenny	24 14	
Site 46	Dairy and cattle	Waterford	23 11	8.8.05
Site 47	Cattle and sheep	Carlow	27 14	9.8.05
Site 48	Dairy and cattle	Wexford	32 14	9.8.05
Site 49	Dairy and cattle	Wexford	32 14	9.8.05
Site 50	Dairy and cattle	Meath	27 27	10.8.05

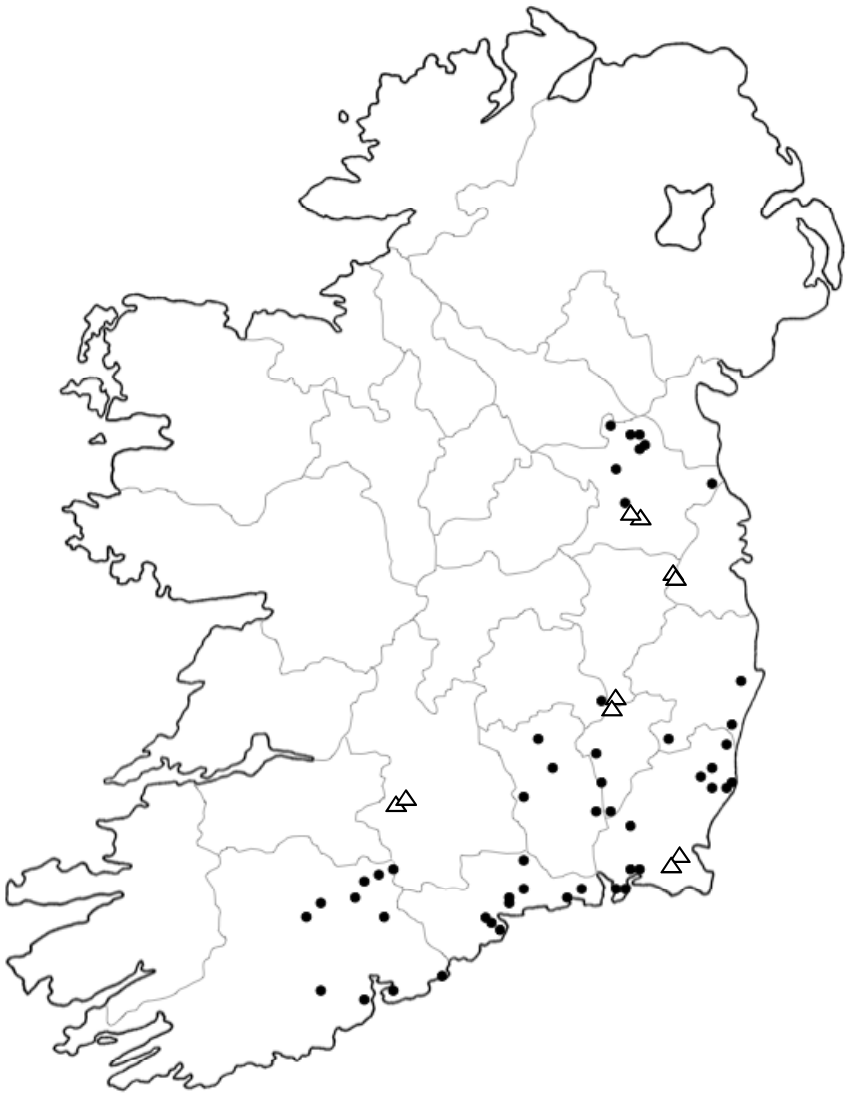

FIGURE 1. Sites sampled for grassland arthropods during the Ag-Biota Project. Open triangles indicate the original 10 sites sampled in 2002 and 2003. These were also the locations of the 'Action 2' sites. Closed circles show the location of the 50 sites sampled during 2005.

APPENDIX 1. Summary list of new county records collected during the Ag-Biota project.

Cork: *Leptorhoptrum robustum*, *Meioneta rurestris* and *Tibellus oblongus*.

Kildare: *Centromerita bicolor*, *Ceratinella scabrosa*, *Dicymbium nigrum*, *Dicymbium tibiale*, *Micrargus herbigradus*, *Oedothorax retusus*, *Silometopus reussi*, *Pardosa palustris* and *Robertus neglectus*.

Kilkenny: *Agyneta decora*, *Erigone dentipalpis, Lepthyphantes ericaeus*, *M. rurestris* and *Ostearius melanopygius*.

Laois: *Erigone dentipalpis* and *Oedothorax fuscus*.

Meath: *A. decora*, *Ceratinella brevipes*, *Diplocephalus latifrons*, *Erigonella hiemalis*, *G. vivum*, *L. ericaeus*, *L. robustum*, *M. rurestris*, *O. melanopygius*, *Alopecosa pulverulenta*, *Pardosa amentata*, *P. palustris*, *P. pullata*, *Trochosa ruricola* and *Pachygnatha degeeri*.

Waterford: *D. nigrum*, *L. robustum*, *M. rurestris*, *O. retusus* and *Peponocranium ludicrum* and *Silometopus elegans*.

Wexford: *D. tibiale*, *D. latifrons*, *Lepthyphantes insignis*, *L. robustum*, *M. rurestris*, *O. apicatus*, *Pelecopsis parallela*, *Pocadicnemis juncea* and *S. reussi*.

Wicklow: *E. dentipalpis*, *M. rurestris*, *M. subaequalis*, *O. fuscus*, *Savignia frontata* and *Ero cambridgei*.

ARTHROPOD BIODIVERSITY OF AGRICULTURAL GRASSLAND IN SOUTH AND EAST IRELAND: HEMIPTERA

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Abstract

Hemiptera were collected from Irish agricultural grasslands between 2002 and 2006, during the Ag-Biota Project. A total of 78 species from 17 families were found. These species are listed, together with the sites where they were found and an indication of their overall relative abundance. Some comments are given regarding the most widespread species.

Introduction

This paper is one of a series of four publications arising from the Ag-Biota (2002-2006) Project (Purvis *et al.*, 2005), which give details of the arthropods collected from 64 agricultural grassland sites in south and east Ireland. Further details of the sites and the collection methods used can be found in the first of these publications (Anderson *et al.*, 2008). In this paper, species records for Hemiptera are listed. For each species the locations where they were found and an indication of their relative abundance are given.

Methods

Hemiptera were collected by suction sampling grassland vegetation at all sites and by sweep netting at Johnstown Castle, Co. Wexford. Further details of sampling methods and sites (including abbreviations used in site identification) are given by Anderson *et al.* (2008).

The Psylloidea were identified to species using Hodkinson and White (1979), with nomenclature following the same authors. For the Auchenorrhyncha, Holzinger *et al.* (2003), Le Quesne (1960a, b, 1965, 1969) and Le Quesne and Payne (1981) were used with nomenclature following Le Quesne and Payne (1981). Southwood and Leston (1959) and (Nau, 2002b) were used for the identification of Heteroptera, with nomenclature following Nau (2002a). Heie (1980), Stroyan (1984) and Taylor (1984) were used for the identification and nomenclature of the Aphidoidea.

Results and discussion

A total of 78 species of Hemiptera from 17 families were recorded from the 64 sites sampled between 2002 and 2006. A further 22 taxa were identified to genus or morphospecies level. The following list gives the numbers of individuals of each species recorded by county in bold, and the locations where they were found in parentheses.

Sternorrhyncha: Aphidoidea: Aphididae

Acyrthosiphon pisum (Harris): Carlow **4** (5); Cork **5** (33); Kildare **2** (LR); Kilkenny **1** (6); Meath **5** (GR); Tipperary **2** (SH, SHC); Waterford **1** (17); Wexford **12** (1, 2, 36, $JC_{co,}$, JC_{tf}).

Brachycaudus helichrysi (Kaltenbach): Meath **1** (GR); Wexford **47** (JC_{fm}).

Megoura viciae Buckton: Waterford **2** (34, 40); Wexford **3** ($JC_{co,}$, JC_{fm}).

Microlophium evansi (Theobald): Meath **13** (GR); Waterford **3** (17, 34, 43); Wexford **6** (JC_{co}).

Myzus cerasi (Fabricius): Meath **2** (GR).

Sitobion avenae (Fabricius): Carlow **15** (5, 23, OP); Cork **83** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **8** (LD, LH, LR); Kilkenny **10** (6, 24, 45); Laois **1** (7); Meath **63** (3, 4, 18, 19, 21, 22, 50, GR); Tipperary **2** (SH); Waterford **51** (16, 17, 34, 35, 41, 42, 43, 46); Wexford **146** (1, 2, 8, 9, 36, 37, 38, 39, JC, JC_{co}, JC_{fm}, JC_{tf}, JCC); Wicklow **15** (10, 25, 26, 27).

Sitobion fragariae (Walker): Carlow **10** (5, 23); Cork **28** (11, 12, 13, 14, 15, 28, 29, 33); Kilkenny **2** (6, 24); Meath **23** (4, 18, 19, 20, 21, 50, GR); Waterford **22** (16, 34, 35, 40, 42); Wexford **674** (1, 9, 38, 48, JC, JC_{co}, JC_{fm}, JC_{tf}, JCC); Wicklow **7** (10, 25, 27).

Sternorrhyncha: Aphidoidea: Callaphididae

Drepanosiphum platanoides (Schrank): Wexford **33** (JC_{co}, JC_{fm}).

Myzocallis coryli (Goeze): Carlow **5** (5); Cork **17** (11, 28, 29, 31, 33); Kilkenny **2** (24); Waterford **8** (17, 34); Wexford **62** (1, 2, 9, 36, 37, JC_{fm}); Wicklow **3** (27).

Phyllaphis fagi (L.): Wexford **3** (JC_{fm}).

Sternorrhyncha: Aphidoidea: Chaitophoridae

Atheroides serrulatus Haliday: Carlow **21** (5); Cork **4** (31, 33); Kildare **2** (LR); Kilkenny **1** (6); Meath **16** (3, 4, 18, 19, GR); Waterford **7** (16, 17, 34); Wexford **9** (1, 9, JC_{co}, JC_{fm}); Wicklow **2** (27).

Chaitophorus beuthani (Börner): Wexford **2** (JC_{fm}).

Sipha glyceriae (Kaltenbach): Carlow **5** (5, 23, OP); Cork **37** (13, 15, 28, 29, 31, 32, 33); Kildare **38** (LD, LH, LR); Meath **155** (GR); Tipperary **12** (SH, SHC); Waterford **142** (34, 35, 43); Wexford **1018** (9, 37, 39, 48, 49, JC, JC_{co}, JC_{fm}, JC_{tf}).

Sternorrhyncha: Aphidoidea: Pemphigidae

Tetraneura ulmi (L.): Kilkenny **1** (24); Wexford **7** (8, JC).

Thecabius affinis (Kaltenbach): Carlow **29** (47); Cork **127** (11, 12, 15, 28, 30, 32, 33); Meath **83** (18, 50, GR, GRC); Waterford **12** (34, 35, 42); Wexford **38** (8, 49, JC_{co}, JC_{fm}, JC_{tf}); Wicklow **5** (27).

Sternorrhyncha: Psylloidea: Aphalaridae

Aphalara exilis (Weber and Mohr): Cork **1** (32); Meath **1** (GR); Waterford **1** (16); Wexford **4** (JC_{fm}).

Sternorrhyncha: Psylloidea: Psyllidae

Psylla melanoneura Förster: Wexford **3** (JC_{fm}, JC_{co}).

Psylla sorbi (L.): Meath **1** (19); Wexford **1** (JC_{fm}); Wicklow **2** (27).

Psyllopsis discrepans (Flor): Wexford **1** (JC_{fm}).

Sternorrhyncha: Psylloidea: Triozidae

Trioza galii Förster: Kilkenny **1** (6).

Trioza urticae (L.): Cork **2** (31); Waterford **5** (43); Wexford **7** (36, JC_{fm}).

Cicadomorpha: Cercopidae

Neophilaenus lineatus (L.): Carlow **1** (23); Cork **2** (28, 33); Meath **1** (18); Tipperary **1** (SH); Waterford **1** (16); Wexford **172** (1, 8, 36, 37, 49, JC_{fm}, JC_{tf}); Wicklow **1** (25).

Philaenus spumarius (L.): Cork **3** (12, 15, 33); Kilkenny **3** (24, 44); Meath **6** (19, 21, GR); Waterford **5** (35, 41, 43); Wexford **157** (JC_{fm}, JC_{co}, JC_{tf}).

Cicadomorpha: Cicadellidae

Aphrodes albifons (L.): Meath **1** (GR); Wexford **104** (JC_{fm}); Wicklow **5** (25, 26, 27).

Aphrodes flavostriatus (Donovan): Meath **9** (21); Wexford **4** (JC_{fm}).

Aphrodes makarovi Zakhvatkin: Wexford **1** (JC_{co}).

Arthaldeus pascuellus (Fallén): Wexford **7** (JC_{fm}).

Balclutha punctata (Fabricius): Wexford **13** (JC_{fm}).

Cicadella viridis (L.): Wexford **18** (JC_{fm}, JC_{co}); Wicklow **4** (27).

Conosanus obsoletus (Kirschbaum): Wexford **2** (JC_{fm}); Wicklow **1** (26).

Deltocephalus pulicaris (Fallén): Meath **21** (21).

Edwardsiana rosae (L.): Wexford **2** (JC_{fm}).

Elymana sulphurella (Zetterstedt): Wexford **11** (JC_{fm}).

Eupteryx aurata (L.): Wexford **6** (JC_{fm}).

Eupteryx urticae (Fabricius): Cork **6** (28, 31, 33); Kildare **1** (LR); Meath **2** (21, 22); Waterford **10** (16, 17, 34, 35); Wexford **5** (8, 37); Wicklow **1** (27).

Euscelis incisus (Kirschbaum): Carlow **5** (23, 47); Cork **9** (32); Wexford **28** (36, 37, 48, 49, JC_{fm}, JC_{co}); Wicklow **7** (10).

Euscelis lineolatus Brullé: Cork **1** (15); Wexford **6** (JC_{co}); Wicklow **5** (27).

Fagocyba cruenta (Herrich-Schaeffer): Wexford **2** (JC_{fm}).

Macrosteles laevis (Ribaut): Carlow **8** (47, OP); Kildare **2** (LH); Meath **21** (3, 18, 21, 50, GR); Tipperary **12** (SH, SHC); Waterford **1** (42); Wexford **10** (49, JC_{fm},

JC_{co}).

Macrosteles sexnotatus (Fallén): Cork **4** (32); Kilkenny **3** (24); Meath **15** (GR); Tipperary **48** (SH, SHC); Waterford **1** (16); Wexford **2** (36); Wicklow **1** (27).

Macrosteles viridigriseus (Edwards): Carlow **9** (47, OP); Kildare **2** (LD, LH); Meath **60** (GR); Waterford **26** (35, 41, 42); Wexford **279** (2, 48, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **23** (25, 27).

Megophthalmus scanicus (Fallén): Meath **3** (21); Waterford **1** (34); Wexford **14** (JC_{fm}, JC_{co}); Wicklow **3** (27).

Ribautiana debilis (Douglas): Wexford **2** (JC_{fm}).

Streptanus sordidus (Zetterstedt): Cork **2** (15); Kildare **1** (LD); Meath **2** (21); Waterford **1** (35); Wexford **46** (37, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **3** (10, 25).

Fulgoromorpha: Delphacidae

Conomelus anceps (Germar): Wexford **1** (JC_{fm}); Wicklow **3** (27).

Dicranotropis hamata (Boheman): Wexford **11** (JC_{fm}).

Javesella dubia (Kirschbaum): Carlow **2** (47); Meath **2** (18, GR); Waterford **1** (35); Wexford **207** (37, 48, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **2** (27).

Javesella obscurella (Boheman): Carlow **15** (5, 23, 47); Cork **238** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kilkenny **7** (6, 44, 45); Meath **118** (19, 21, 50, GR); Tipperary **1** (SH); Waterford **204** (17, 34, 35, 41, 43, 46); Wexford **259** (1, 2, 8, 9, 37, 38, 48, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **46** (0, 25, 26, 27).

Javesella pellucida (Fabricius): Carlow **10** (5, 47); Cork **53** (11, 12, 15, 28, 29, 30, 31, 32, 33); Kildare **11** (LD, LR); Kilkenny **12** (24, 44); Meath **28** (21, 50, GR); Tipperary **3** (SH); Waterford **14** (34, 35, 40, 41, 42, 43); Wexford **85** (8, 9, 36, 37, 38, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **17** (10, 25, 26, 27).

Megamelodes quadrimaculatus (Signoret): Wexford **13** (JC_{fm}, JC_{co}).

Muellerianella fairmairei (Perris): Waterford **22** (17, 35, 41, 46); Wexford **418** (8, 39, JC_{fm}, JC_{tf}); Wicklow **5** (25, 27).

Oncodelphax pullulus (Boheman): Wexford **2** (JC_{fm}).

Paraliburnia clypealis (J. Sahlberg): Kildare **1** (LH); Meath **1** (GR); Wexford **145** (JC_{fm}, JC_{co}, JC_{tf}).

Heteroptera: Anthocoridae

Anthocoris nemorum (L.): Meath **3** (GR); Waterford **4** (41, 43); Wexford **34** (JC_{fm}, JC_{co}); Wicklow **1** (27).

Orius laevigatus (Fieber): Wexford **2** (JC_{fm}).

Heteroptera: Lygaeidae

Drymus sylvaticus (Fabricius): Meath **2** (GR).

Scolpstethus thomsoni Reuter: Waterford **1** (16); Wicklow **2** (27).

Stygnocoris fuligineus (Geoffroy): Kilkenny **1** (24); Wicklow **1** (26).

Heteroptera: Miridae

Calocoris norvegicus (Gmelin): Cork **5** (11, 12, 33); Meath **4** (18, 21); Waterford **4** (16, 34, 43); Wexford **3** (38, JC_{fm}).

Capsus ater (L.): Wexford **2** (JC_{fm}).

Leptopterna dolabrata (L.): Wexford **11** (JC_{fm}, JC_{tf}).

Lygus rugulipennis Poppius: Cork **1** (32); Waterford **4** (17, 42, 43); Wexford **8** (36, 37, JC_{fm}, JC_{co}).

Mecomma ambulans (Fallén): Waterford **1** (35).

Orthops campestris (L.): Wexford **38** (JC_{fm}).

Pithanus maerkeli (Herrich-Schäffer): Cork **6** (14, 28, 29, 32, 33); Kilkenny **3** (6, 24, 44); Meath **6** (20, 21, GR); Waterford **7** (16, 17, 41, 43, 46); Wexford **67** (2, 36, 48, 49, JC_{fm}, JC_{tf}); Wicklow **19** (10, 27).

Plagiognathus arbustorum (Fabricius): Cork **1** (28); Meath **1** (19).

Plagiognathus chrysanthemi (Wolff): Wexford **2** (JC_{fm}).

Stenodema calcarata (Fallén): Cork **1** (29); Meath **1** (GR); Wexford **48** (JC_{fm}, JC_{tf}).

Stenodema laevigata (L.): Kilkenny **1** (44); Waterford **1** (35); Wexford **4** (JC_{fm}, JC_{co}).

Trigonotylus ruficornis (Geoffroy): Wexford **2** (JC_{fm}).

Tytthus pygmaeus (Zetterstedt): Cork **1** (33); Waterford **3** (35, 41, 46); Wexford **7** (37, JC_{fm}, JC_{tf}).

Heteroptera: Nabidae

Nabis ferus (L.): Cork **1** (15); Meath **1** (GR); Waterford **4** (40, 41, 43); Wexford **37** (37, 38, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **1** (10).

Nabis flavomarginatus Scholtz: Wexford **6** (JC_{fm}).

Nabis limbatus Dahlbom: Waterford **2** (16, 17); Wexford **3** (49, JC_{fm}); Wicklow **2** (27).

Heteroptera: Pentatomidae

Dolycoris baccarum (L.): Wexford **6** (JC_{fm}).

Heteroptera: Saldidae

Saldula orthochila (Fieber): Meath **11** (19, 22, 50, GR); Tipperary **2** (SH); Waterford **1** (42).

Saldula saltatoria (L.): Carlow **1** (23); Cork **1** (28); Kilkenny **2** (24); Waterford **4** (17, 34); Wexford **21** (2, 8, JC_{co}, JC_{tf}); Wicklow **6** (27).

Heteroptera: Tingidae

Tingis cardui (L.): Wexford **6** (JC_{fm}, JC_{co}).

By far the most numerous of the Hemiptera were aphids of the genus *Rhopalosiphum* Koch (Aphididae), which was not identified to species level. During the project, 10,069 adults of this genus were found, making up 52% of the total 19,347 adult Hemiptera collected, and they were found at all 64 sampled sites. The genus was probably represented by two species, *R. padi* (L.), the bird cherry-oat aphid and *R. insertum* (Walker), the apple-grass aphid, the separation of which, in many cases, requires morphometric measurements and ratios (Stroyan, 1984; Taylor *et al.*, 1984). It was therefore not practicable to identify individual specimens. However, given that *R. insertum* is usually found at or below ground level (Stroyan, 1984), it is likely that the majority of collected specimens were *R. padi*, which the latter author considered universally distributed and usually abundant.

After *Rhopalosiphum*, the most widespread hemipteran taxon was another aphid genus, *Metopolophium* (Mordvilko), which was found at 55 (86%) sites. The

species involved were likely to have been *M. festucae* (Theobald) and *M. dirhodum* (Walker), both of which are very common in Irish and United Kingdom grassland (Curry, 1987; Curry and Cunningham, 1978; Vickerman, 1976). *Metopolophium* spp., like *Rhopalosiphum*, are grass feeders, as are the two *Sitobion* spp., that were frequently encountered (Carter *et al.*, 1980; Loxdale and Brookes, 1990). The grain aphid, *Sitobion avenae* (Aphididae), was found at 55 (86%) of the sites, and the blackberry-cereal aphid, *S. fragariae* at 36 (56%) of the sites. Species from two other aphid families were also quite widely distributed, with *Sipha glyceriae* (Chaitophoridae), another grass-feeding species (Stroyan, 1977), found at 28 (44%) of the sites, and *Thecabius affinis* (Pemphigidae), which feeds on *Ranunculus* (Heie, 1980), found at 21 (33%) sites. These figures include only adults, and if nymphs of these last two species are added, their total recorded incidence rises to 33 (52%) and 29 (45%) sites, respectively.

Amongst the non-aphid Hemiptera, none were found at all sites, but several were widespread and recorded in half or more of the studied pastures. The leafhopper (Cicadellidae) genus *Macrosteles* was found at 47 (73%) sites. Three species of this genus were found; *M. viridigriseus*, *M. laevis* and *M. sexnotatus*. The females of this group of species cannot be reliably distinguished from each other (Le Quesne, 1969), and so at the 19 sites, where only females were found, it was not possible to establish the species present. Male specimens of *M. viridigriseus* and *M. laevis* were each found at 14 (22%) sites, and male *M. sexnotatus* were found at eight (13%) sites. Both *M. laevis* and *M. sexnotatus* are regarded as pioneer species, typically found in early stages of grassland succession, as well as in agricultural grasslands (Andrzejewska, 1962; Nickel, 2003; Waloff, 1980).

The Delphacidae (planthoppers) were another family of the Auchenorrhyncha, well represented in the samples. Nine species were recorded, of which five were abundant: *Javesella dubia*, *J. obscurella* and *J. pellucida*, *Muellerianella fairmairei* and *Paraliburnia clypealis*. Two of these *Javesella* species were the most abundant and widespread, with 888 specimens of *J. obscurella* collected

from 42 sites (66%), and 233 specimens of *J. pellucida* from 40 sites (63%). Although a relatively large total number of *J. dubia* were collected, this species was not widespread or generally common, as it was found at only 11 (17%) sites. Out of a total of 214 specimens of this species collected, 136 were taken from the experimental, conserved field margin plots sampled at Johnstown Castle (JC_{fm}). A very similar pattern of incidence was found for both *M. fairmairei* and *P. clypealis*, with the majority of specimens collected from the conserved field margin plots at JC_{fm}. These three *Javesella* species and *M. fairmairei* are all grass feeders, with *J. obscurella* and *J. pellucida* being typical of disturbed grasslands, including intensively managed agricultural grasslands (Nickel, 2003). *P. clypealis* is a particularly interesting species, the distribution of which was thought to be restricted to very wet locations, but which in Ireland, appears to be associated with drier field margins (Helden and Sheridan, 2006).

The other family of the Auchenorrhyncha recorded in good numbers was the Cercopidae (froghoppers), represented by two species; *Philaenus spumarius*, with 174 individuals recorded from 14 (22%) sites, and *Neophilaenus lineatus*, with 179 specimens collected from 14 (22%) sites. *N. lineatus* is a grass feeder, while *P. spumarius* is very polyphagous, but particularly associated with broadleaved plants (Nickel, 2003). *P. spumarius* is a very widespread species, which may have been under-recorded at most, if not all sites for reasons of phenology and sampling methodology. Many individuals were likely to have been immature when many of the sites were sampled, and the random point sampling strategy used is unlikely to have collected many specimens of species specifically associated with common, but discretely located broadleaved host plants such as *Rumex*, which were clearly present at many of the sites.

The only member of the Heteroptera found to be widespread in the samples was *Pithanus maerkeli*, a member of the family Miridae. It was found at 24 (38%) sites, where 108 individuals were found. It is a very widely distributed species, typical of meadow grasslands (Curry and O'Neill, 1979; Southwood and Leston, 1959). Miridae are largely plant-feeding bugs, and were by far the most diverse of

the heteropteran families collected, with 12 other species found in relatively small numbers, often at relatively few sites. The genera *Anthocoris* (Anthocoridae), *Nabis* (Nabidae) and *Saldula* (Saldulidae) also warrant specific mention as predatory heteropteran taxa, with multiple species found in small numbers at a limited range of sites.

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ARTHROPOD BIODIVERSITY OF AGRICULTURAL GRASSLAND IN SOUTH AND EAST IRELAND: COLEOPTERA

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Abstract

A summary is given of the Coleoptera collected from Irish lowland agricultural grasslands between 2002 and 2006, during the Ag-Biota Project. A total of 249 species from 23 families were recorded. These species are listed, together with the sites where they were found and an indication of their overall relative abundance. Some comments are given regarding the most widespread and some unusual species.

Introduction

This paper is part of a series of four publications arising from the Ag-Biota Project during the period 2002-2006 (Purvis *et al.*, 2005), in which the biodiversity of arthropods found in 64 agricultural grassland sites within the south and east of Ireland are reported. Further details of the sites and the collection methods used can be found in the first of these publications (Anderson *et al.*, 2008), while in this paper, the species of Coleoptera found are listed.

Methods

Coleoptera were collected using several techniques including suction sampling of field vegetation, pitfall trapping, sweep netting and extraction from tussock samples. Further details of these methods and the sites on which they were employed can be found in Anderson *et al.* (2008).

Coleoptera were identified to species except for the Aleocharinae, which in most cases were identified initially to morphospecies, and wherever possible subsequently allocated to genera. In some instances, such as the genera *Amischa* and *Aleochara* it was possible to identify specimens of these aleocharines to species. The following sources were used in identifications:- Booth (1984, 1988); Coiffait (1972, 1974, 1978); Doguet (1994); Forsythe (2000); Friday (1988); Hammond (1973); Johnson (1966); Joy (1932); Lindroth (1974); Morris (1990, 1997, 2002); Pope (1953); Salt and Whittaker (1998); Steel (1946); Strand and Vik (1964, 1966); Tottenham (1948, 1954); Welch (1997); Williams (1969). The nomenclature for the Coleoptera follows the *Checklist of Beetles of the British Isles* (2008 edition) (Alexander, 2008; Booth, 2008a, b, c, d; Cooter, 2008; Cox, 2008; Duff, 2008; Foster, 2008a, b; Johnson, 2008a, b, c, d, e, f; Lott, 2008; Luff, 2008; Mann, 2008; Mendel, 2008; Morris, 2008a, b, c).

Results and discussion

Between 2002 and 2006, 249 species and 29 morphospecies of 23 families of Coleoptera were collected from 64-grazed agricultural grassland sites during the Ag-Biota project. The following list gives the numbers of recorded individuals of each species by county, in bold, and the locations where they were found in parentheses. For site details and abbreviations see Anderson *et al.* (2008). Morphospecies records are excluded. Given that sampling methodology, intensity and date varied considerably between sites, the data presented have little value in direct comparison of locations or counties. However, they do give an overall indication of the relative abundance of different species in Irish lowland agricultural grasslands.

Apionidae

Apion frumentarium (Linnaeus): Cork **2** (32, 33); Waterford **2** (34, 42); Wexford (JC_{co}).

Ceratapion carduorum (Kirby): Meath **1** (21); Waterford **4** (41); Wexford **3** (1,

JC_{fm}).

Ischnopterapion virens (Herbst): Carlow **7** (5, 47); Cork **141** (11, 12, 15, 28, 29, 31, 32, 33); Kildare **2** (LD); Kilkenny **28** (6, 24, 44, 45); Laois **4** (7); Meath **32** (4, 18, 19, 20, 21, 50, GR); Tipperary **6** (SH, SHC); Waterford **35** (17, 34, 35, 41, 42); Wexford **87** (1, 36, 37, 38, 39, 48, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **18** (10, 25, 26, 27).

Perapion hydrolapathi (Marsham): Waterford **3** (34, 40); Wexford **39** (JC_{fm}); Wicklow **1** (27).

Perapion marchicum (Herbst): Wexford **1** (JC_{fm}).

Protapion apricans (Herbst): Wexford **2** (JC_{co}).

Protapion fulvipes (Geoffroy in Fourcroy): Carlow **7** (5, 47); Cork **48** (11, 12, 28, 29, 30, 31); Kildare **2** (LH, LR); Kilkenny **3** (6, 44); Laois **3** (7); Meath **28** (3, 4, 18, 20, 21, GR); Tipperary **3** (SHC); Waterford **14** (17, 35, 41); Wexford **103** (1, 8, 36, 37, 38, 39, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **21** (10, 26, 27).

Cantharidae

Cantharis nigra (De Geer): Meath **1** (GR); Wexford **150** (JC_{fm}, JC_{co}).

Cantharis pallida Goeze: Wexford **1** (8).

Rhagonycha fulva (Scopoli): Cork **3** (13, 31, 33); Meath **1** (18); Wexford **14** (JC_{fm}).

Malthodes pumilus (Brébisson): Carlow **1** (5); Meath **1** (GR).

Carabidae

Abax parallelepipedus (Piller and Mitterpacher): Kildare **2** (LH).

Agonum fuliginosum (Panzer): Wicklow **1** (27).

Agonum marginatum (Linnaeus): Waterford **1** (34); Wexford **1** (JC_{tf}).

Agonum muelleri (Herbst): Carlow **1** (47); Cork **3** (15, 32); Meath **30** (19, GR, GRC); Tipperary **302** (SH, SHC); Waterford **1** (17); Wexford **745** (JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **2** (10, 26).

Agonum viduum (Panzer): Wexford **7** (JC_{tf}).

Amara aenea (De Geer): Kildare **4** (LD,LH); Meath **3** (GR, GRC); Wexford **2** (JC_{tf}, JCC).

Amara communis (Panzer): Carlow **2** (OP); Wexford **5** (JC_{fm}, JC_{tf}).

Amara familiaris (Duftschmid): Wexford **1** (JC_{tf}).

Amara montivaga Sturm: Wexford **5** (JC_{tf}).

Amara ovata (Fabricius): Kilkenny **1** (45); Wexford **8** (JC_{tf}).

Amara plebeja (Gyllenhal): Carlow **5** (OP); Kildare **2** (LD); Wexford **43** (JC_{tf}, JCC); Wicklow **1** (26).

Amara similata (Gyllenhal): Tipperary **1** (SH).

Amara tibialis (Paykull): Wexford **1** (JC_{tf}).

Anchomenus dorsalis (Pontoppidan): Carlow **4** (5, OP); Cork **1** (33); Kildare **1** (LR); Kilkenny **1** (44); Meath **4** (20, GR, GRC); Tipperary **27** (SH, SHC); Waterford **8** (16, 34, 35, 42); Wexford **110** (JC, JC_{fm}, JC_{co}, JC_{tf}, JCC)

Badister sodalis (Duftschmid): Wexford **1** (JC_{tf}).

Bembidion aeneum Germar: Cork **33** (11, 14, 28, 29, 30, 31); Kildare **7** (LD, LR); Meath **17** (18, 19, 22, 50, GR); Tipperary **74** (SH, SHC); Waterford **60** (34, 40, 46); Wexford **471** (9, 36, 37, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **3** (26, 27).

Bembidion guttula (Fabricius): Carlow **1** (5); Cork **18** (28, 29, 30, 31, 32, 33); Kildare **10** (LH, LR); Kilkenny **3** (24, 44, 45); Meath **29** (18, 19, 20, 21, 50, GR); Tipperary **4** (SHC); Waterford **21** (34, 35, 40, 42, 46); Wexford **52** (1, 8, 36, 37, 39, 48, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **19** (10, 25, 26, 27).

Bembidion lampros (Herbst): Carlow **135** (5, 23, 47, OP); Cork **45** (14, 15, 28, 29, 30, 31, 32, 33); Kildare **83** (LD, LH, LR, OPC); Kilkenny **28** (6, 24, 44, 45); Laois **2** (7); Meath **78** (19, 20, 21, 50, GR, GRC); Tipperary **97** (SH, SHC); Waterford **57** (17, 34, 40, 41, 42, 46); Wexford **1155** (1, 2, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **4** (26, 27).

Bembidion obtusum Audinet-Serville: Carlow **1** (OP); Cork **1** (32); Kildare **18** (LR); Waterford **3** (43); Wexford **5** (38, 39, JCC); Wicklow **1** (27).

Calathus fuscipes (Goeze): Carlow **5** (OP); Kildare **3** (OPC).

Calathus melanocephalus (Linnaeus): Carlow **2** (5, OP); Cork **2** (13); Kilkenny **4** (6, 44); Meath **8** (18, 19, 21, 50, GRC); Waterford **4** (41); Wexford **80** (38, JC_{fm}, JC_{co}, JC_{tf}).

Carabus granulatus Linnaeus: Meath **1** (GRC); Tipperary **12** (SH, SHC); Wexford **8** (JC_{tf}, JCC).

Clivina fossor (Linnaeus): Kildare **5** (L); Meath **51** (GR, GRC); Tipperary **43** (SH, SHC); Wexford **127** (JC, JC_{co}, JC_{tf}, JCC).

Demetrias atricapillus (Linnaeus): Wexford **4** (JC_{fm}, JC_{co}).

Elaphrus cupreus Duftschmid: Meath **1** (GRC); Tipperary **1** (SHC).

Harpalus rufipes (De Geer): Carlow **1** (OP); Wexford **18** (JC, JC_{tf}).

Loricera pilicornis (Fabricius): Carlow **55** (OP); Cork **9** (11, 14, 15, 30); Kildare **374** (LR, OPC); Kilkenny **2** (6, 44); Meath **262** (4, 19, 20, 22, GR, GRC); Tipperary **176** (SH, SHC); Waterford **3** (17, 34, 42); Wexford **485** (1, 9, 36, 38, JC, JC_{tf}, JCC); Wicklow **1** (10).

Nebria brevicollis (Fabricius): Carlow **434** (OP); Kildare **803** (LD, LH, OPC); Meath **577** (GR, GRC); Tipperary **782** (SH, SHC); Wexford **2817** (JC_{co}, JC_{tf}, JCC).

Notiophilus biguttatus (Fabricius): Cork **1** (15); Kildare **3** (LD, LR); Tipperary **1** (SH); Wexford **6** (36, JC, JC_{fm}, JC_{co}, JC_{tf}).

Notiophilus substriatus Waterhouse, G.R.: Kildare **1** (LR).

Oxypselaphus obscurus (Herbst): Cork **1** (31).

Paradromius linearis (Olivier): Kilkenny **1** (24).

Poecilus cupreus (L.): Carlow **1** (OP); Tipperary **3** (SH, SHC); Wexford **17** (JC, JCC).

Poecilus versicolor (Sturm): Carlow **1** (OP); Kildare **3** (LD, LH); Wexford **13** (JC, JCC).

Pterostichus madidus (Fabricius): Carlow **1** (OP); Meath **3** (GR); Tipperary **1** (SHC); Wexford **34** (JC_{tf}).

Pterostichus melanarius (Illiger): Carlow **22** (OP); Kildare **43** (LD, LH, OPC); Meath **9** (GR, GRC); Tipperary **15** (SH, SHC); Wexford **766** (JC, JC_{tf}, JCC).

Pterostichus niger (Schaller): Wexford **1** (JCC).

Pterostichus nigrita (Paykull): Carlow **1** (OP); Tipperary **8** (SH, SHC); Wexford **27** (JC_{tf}).

Pterostichus strenuus (Panzer): Carlow **116** (23, 47, OP); Cork **9** (12, 31, 32, 33); Kildare **66** (LD, LH, OPC); Kilkenny **12** (6, 24, 44, 45); Laois **1** (7); Meath **91** (3, 4, 18, 19, 21, 22, 50, GR, GRC); Tipperary **139** (SH, SHC); Waterford **15** (16, 34, 35, 40, 42, 43, 46); Wexford **301** (2, 8, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **4** (10, 26, 27).

Pterostichus vernalis (Panzer): Carlow **44** (OP); Cork **5** (12, 29, 30, 31, 33); Kildare **45** (LD, LH, OPC); Laois **1** (7); Meath **22** (3, GR, GRC); Tipperary **36** (SH, SHC); Waterford **3** (16, 17, 46); Wexford **315** (JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **3** (25, 26, 27).

Trechus obtusus Erichson: Kildare **1** (LR); Wexford **48** (39, JC_{fm}, JCC).

Trechus quadristriatus (Schrank): Carlow **2** (OP); Cork **1** (31); Kildare **11** (LD, LH, LR, OPC); Laois **1** (7); Meath **3** (GR); Tipperary **1** (SH); Waterford **2** (40, 43); Wexford **36** (38, JC_{fm}, JC_{co}, JC_{tf}, JCC).

Chrysomelidae

Chrysolina banksi (Fabricius): Wexford **1** (JC_{fm}).

Gastrophysa viridula (De Geer): Cork **11** (14, 28, 29, 30); Meath **3** (19, 22); Wexford **2** (JC_{fm}).

Lema cyanella (Linnaeus): Cork **2** (32, 33); Kilkenny **1** (44); Meath **2** (18, GR); Waterford **1** (41); Wexford **1** (37).

Oulema septentrionis (Weise): Wexford **2** (JC_{fm}).

Chaetocnema concinna (Marsham): Kildare **1** (LR); Meath **2** (19); Wexford **10** (JC_{fm}, JC_{co}, JC_{tf}).

Longitarsus flavicornis (Stephens): Waterford **2** (34, 35); Wexford **23** (36, 37, 38, JC_{fm}, JC_{co}).

Longitarsus luridus (Scopoli): Cork **1** (32); Meath **41** (21, GR); Wexford **68** (36, 38, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **3** (27).

Longitarsus melanocephalus (De Geer): Kildare **1** (LR); Wexford **2** (JC_{fm}, JC_{co}).

Neocrepidodera ferruginea (Scopoli): Carlow **3** (5, 23); Cork **9** (12); Kildare **4** (LR); Kilkenny **27** (6, 24, 44); Meath **8** (3, 19, 20); Waterford **32** (16, 35, 41, 43, 46); Wexford **36** (1, 8, 38, JC_{fm}); Wicklow **2** (27).

Neocrepidodera transversa (Marsham): Wexford **2** (JC_{fm}).

Psylloides chrysocephala (Linnaeus): Tipperary **1** (SH); Wexford **1** (JC_{fm}).

Clambidae

Clambus armadillo (De Geer): Cork **1** (33); Waterford **1** (35); Wexford **3** (49, JC_{fm}); Wicklow **2** (27).

Clambus pubescens Redtenbacher: Wexford **6** (JC_{fm}); Wicklow **1** (10).

Coccinellidae

Coccidula rufa (Herbst): Carlow **1** (OP); Meath **3** (GR); Wexford **58** (36, 37, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **1** (26).

Rhyzobius litura (Fabricius): Waterford **1** (46); Wexford **7** (JC_{fm}); Wicklow **4** (27).

Coccinella septempunctata Linnaeus: Cork **2** (29, 32); Kildare **1** (OPC); Kilkenny **1** (44); Meath **1** (21); Waterford **9** (34, 35, 42); Wexford **12** (JC_{fm}).

Propylea quattuordecimpunctata (Linnaeus): Cork **1** (15); Waterford **3** (35); Wexford **2** (JC_{fm}).

Psyllobora vigintiduopunctata (Linnaeus): Wexford **2** (JC_{co}).

Corylophidae

Corylophus cassidoides (Marsham): Waterford **1** (40); Wexford **1** (38).

Sericoderus lateralis (Gyllenhal): Carlow **1** (5).

Cryptophagidae

Atomaria apicalis Erichson: Carlow **8** (5, 47); Cork **84** (11, 12, 14, 15, 28, 29, 31, 32, 33); Kilkenny **12** (6, 44, 45); Meath **15** (3, 4, 19, GR); Waterford **50** (17, 34, 40, 41, 42, 43, 46); Wexford **258** (1, 8, 36, 37, 38, 39, 48, 49, JC_{fm}, JC_{co}); Wicklow **3** (27).

Atomaria atricapilla Stephens: Carlow **4** (5, OP); Cork **69** (14, 15, 28, 29, 31, 33); Kildare **2** (LR); Kilkenny **4** (6, 24); Meath **6** (18, 50, GR); Tipperary **2** (SH); Waterford **127** (16, 34, 40, 41, 42, 46); Wexford **770** (1, 2, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **2** (26).

Atomaria fuscata (Schönherr): Cork **1** (15).

Atomaria linearis Stephens: Kilkenny **1** (6); Waterford **1** (16); Wexford **2** (JC_{tf}).

Atomaria nitidula (Marsham): Carlow **2** (5); Cork **35** (11, 13, 15, 28, 30, 31, 32,

33); Kildare **2** (LR); Kilkenny **9** (6, 24, 44); Meath **44** (3, 4, 18, 19, 20, 22, GR); Waterford **48** (16, 17, 34, 40, 41, 42, 46); Wexford **159** (1, 36, 37, 38, 39, 48, 49, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **9** (10, 27).

Atomaria pusilla (Paykull): Kilkenny **1** (6); Meath **1** (18).

Atomaria testacea (Stephens): Wexford **4** (JC_{fm}).

Atomaria umbrina (Gyllenhal): Cork **1** (31).

Ephistemus globulus (Paykull): Cork **8** (31, 32, 33); Meath **2** (50); Waterford **2** (40); Wexford **107** (36, 37, 48, 49, JC_{fm}, JC_{co}, JC_{tf}).

Micrambe vini (Panzer): Wexford **2** (JC_{fm}).

Curculionidae

Ceutorhynchus erysimi (Fabricius): Carlow **1** (47); Meath **4** (21, GR).

Ceutorhynchus typhae (Herbst): Wexford **9** (1, 37, JC_{fm}).

Nedyus quadrimaculatus (Linnaeus): Laois **1** (7); Waterford **16** (35, 43).

Rhinoncus pericarpius (Linnaeus): Cork **6** (28, 32, 33); Kilkenny **3** (6, 44); Meath **5** (19, 20, 21); Waterford **18** (17, 40, 42); Wexford **56** (8, 38, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **2** (27).

Euophryum confine (Broun): Meath **2** (19, 50); Wicklow **1** (10).

Mecinus pyraster (Herbst): Wexford **1** (JC_{fm}).

Orchestes fagi (Linnaeus): Wexford **3** (JC_{fm}).

Tychius picirostris (Fabricius): Wexford **1** (JC_{co}).

Barypeithes pellucidus (Boheman): Meath **1** (GR).

Polydrusus formosus (Mayer): Wexford **3** (JC_{fm}).

Sitona hispidulus (Fabricius): Kilkenny **5** (45); Waterford **3** (41); Wexford **39** (JC_{fm}, JC_{co}).

Sitona lepidus Gyllenhall: Carlow **12** (5, 47); Cork **19** (11, 12, 15, 28, 29, 30, 31, 32, 33); Kildare **23** (LD, LH, LR, OPC); Kilkenny **20** (6, 24, 44, 45); Laois **7** (7); Meath **53** (3, 18, 19, 21, GR); Tipperary **12** (SH); Waterford **20** (17, 34, 35, 41, 42, 46); Wexford **189** (1, 8, 9, 36, 37, 38, 39, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **48** (10, 26, 27).

Hypera zoilus (Scopoli): Cork **1** (32); Meath **1** (21).

Hypera rumicis (Linnaeus): Cork **2** (28).

Leiosoma deflexum (Panzer): Carlow **1** (47); Cork **6** (12, 28, 32); Meath **2** (18, GR); Waterford **2** (17, 41); Wexford **7** (JC_{fm}, JC_{co}, JC_{tf}); Wicklow **10** (27).

Elateridae

Adrastus pallens (Fabricius): Wicklow **3** (26).

Agriotes obscurus (Linnaeus): Wicklow **1** (25).

Helophoridae

Helophorus brevipalpis Bedel: Carlow **1** (5); Cork **13** (13, 14, 28, 30, 31); Kilkenny **1** (24); Laois **2** (7); Meath **33** (3, 4, 19, 20, 22, 50, GR); Waterford **3** (16, 34); Wexford **15** (1, 9, 37, 39, JC_{fm}, JC_{tf}).

Helophorus flavipes Fabricius: Meath **1** (3).

Helophorus grandis Illiger: Cork **2** (14, 28); Meath **1** (50).

Helophorus obscurus Mulsant: Cork **2** (28).

Histeridae

Onthophilus striatus (Forster): Carlow **1** (5); Kilkenny **1** (44); Waterford **1** (42).

Hydrophilidae

Cercyon haemorrhoidalis (Fabricius): Carlow **2** (23); Kildare **1** (LH); Meath **2** (18, GR); Tipperary **2** (SH); Waterford **1** (16); Wexford **1** (JC_{fm}).

Cercyon impressus (Sturm): Carlow **1** (23); Cork **1** (31); Kildare **6** (LH, LR); Kilkenny **2** (44); Meath **5** (4, 22, GR); Wexford **2** (JC_{fm}, JC_{tf}).

Cercyon lateralis (Marsham): Cork **1** (31); Meath **1** (4).

Cercyon melanocephalus Linnaeus: Cork **1** (30); Kilkenny **1** (24); Meath **7** (3, 19, 22, GR); Waterford **1** (42); Wexford **3** (JC_{tf}).

Cercyon nigriceps (Marsham): Meath **1** (3).

Cercyon pygmaeus (Illiger): Meath **2** (4, 22); Wexford **4** (8, 38, 39, JC_{tf}).

Cryptopleurum minutum (Fabricius): Kilkenny **1** (6); Tipperary **1** (SH); Wexford **2** (8, JC_{fm}).

Megasternum concinnum (Marsham): Carlow **35** (5, 23, 47); Cork **118** (11, 12, 13, 14, 28, 29, 30, 31, 32, 33); Kildare **37** (LD, LH, LR, OPC); Kilkenny **43** (6, 24, 44, 45); Meath **221** (3, 4, 18, 19, 20, 21, 22, 50, GR, GRC); Tipperary **15** (SH, SHC);

Waterford **49** (16, 17, 34, 35, 40, 42, 43, 46); Wexford **96** (1, 2, 8, 37, 38, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **17** (25, 26, 27).

Sphaeridium scarabaeoides (Linnaeus): Cork **1** (30); Kilkenny **1** (24).

Kateretidae

Brachypterus urticae (Fabricius): Carlow **1** (5); Meath **1** (GR); Waterford **3** (35); Wexford **3** (JC); Wicklow **2** (25).

Kateretes rufilabris (Latreille): Cork **1** (30); Wexford **1** (JC).

Latridiidae

Corticarina minuta (Fabricius): Carlow **4** (5, 47); Cork **44** (12, 15, 33); Kilkenny **7** (6, 45); Waterford **119** (34, 40, 41, 42, 43, 46); Wexford **957** (1, 2, 9, 36, 37, 38, 39, 48, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **6** (10, 27).

Cortinicara gibbosa (Herbst): Cork **39** (15, 28, 31); Kilkenny **2** (24, 45); Meath **4** (18, GR); Waterford **39** (17, 34, 35, 40, 41, 42, 46); Wexford **149** (1, 36, 37, 39, 48, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **4** (27).

Cartodere nodifer (Westwood): Cork **12** (31, 33); Kilkenny **6** (6, 44); Meath **18** (4, 18, 50, GR); Waterford **9** (17, 34, 40, 41); Wexford **51** (37, 48, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **5** (10, 27).

Dienerella ruficollis (Marsham): Wexford **1** (JC_{tf}).

Enicmus histrio Joy and Tomlin: Carlow **2** (5); Cork **62** (11, 12, 14, 15, 28, 29, 31, 32, 33); Kilkenny **4** (6, 44); Meath **4** (18, GR); Waterford **84** (17, 34, 35, 40, 41, 42, 43, 46); Wexford **346** (2, 9, 36, 37, 38, 39, 48, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **3** (10, 27).

Stephostethus lardarius (De Geer): Carlow **2** (5, 47); Cork **1** (31); Meath **7** (18, GR); Wexford **3** (37, JCC).

Leiodidae

Colon brunneum (Latreille): Waterford **1** (16).

Monotomidae

Monotoma picipes Herbst: Kilkenny **1** (44).

Mycetophagidae

Typhaea stercorea (Linnaeus): Meath **1** (4); Wexford **2** (JC_{fm}).

Nanophyidae

Nanophyes marmoratus (Goeze): Wexford **1** (JC_{fm}).

Nitidulidae

Meligethes aeneus (Fabricius): Waterford **1** (35); Wexford **1** (JC_{tf}).

Meligethes flavimanus Stephens: Wicklow **1** (27).

Ptiliidae

Acrotrichis atomaria (De Geer): Carlow **27** (5, 23, 47, OP); Cork **18** (12, 13, 28, 29, 31, 32); Kildare **20** (LD, LH, LR); Kilkenny **33** (6, 24, 44); Laois **1** (7); Meath **322** (3, 4, 18, 19, 21, 22, 50, GR, GRC); Tipperary **6** (SH, SHC); Waterford **37** (16, 17, 34, 35, 41, 42, 43); Wexford **90** (1, 8, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **170** (25, 26, 27).

Acrotrichis grandicollis (Mannerheim): Carlow **2** (5, 47); Cork **31** (11, 12, 28, 31, 32); Kildare **3** (LH, LR, OPC); Kilkenny **1** (44); Meath **17** (3, 4, GR); Tipperary **1** (SH); Waterford **5** (17, 35); Wexford **14** (8, 39, 49, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **3** (26, 27).

Acrotrichis sericans (Heer): Carlow **1** (47); Cork **1** (31); Meath **2** (4); Waterford **1** (46); Wexford **4** (JC); Wicklow **1** (27).

Ptenidium fuscicorne Erichson: Meath **1** (GR); Wexford **1** (JCC).

Ptenidium nitidum (Heer): Carlow **2** (23, 47); Cork **43** (12, 13, 28, 29, 30, 31, 32, 33); Kildare **5** (LD, LH); Kilkenny **46** (6, 24, 44); Meath **74** (3, 4, 18, 19, 21, 50, GR); Tipperary **5** (SH); Waterford **73** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **123** (1, 2, 8, 37, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **181** (10, 25, 26, 27).

Ptenidium pusillum (Gyllenhal): Carlow **55** (5, 23, 47, OP); Cork **388** (11, 12, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **50** (LD, LH, OPC); Kilkenny **103** (6, 24, 44, 45); Laois **9** (7); Meath **242** (3, 4, 18, 19, 20, 21, 22, 50, GR); Tipperary **16** (SH, SHC); Waterford **286** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **207** (1, 8, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **349** (25, 26, 27).

Pteryx suturalis (Heer): Kildare **1** (LH); Kilkenny **1** (45); Meath **2** (18, GR); Waterford **1** (35); Wexford **2** (48, 49).

Ptiliolum spencei (Allibert): Carlow **5** (23, 47); Kildare **2** (LD, LH); Kilkenny **16** (6, 24, 44); Meath **18** (3, 4, 21, 50, GR); Waterford **3** (35); Wexford **4** (1, JC_{fm}, JC_{tf}); Wicklow **5** (26, 27).

Scarabaeidae

Aphodius ater (De Geer): Wexford **1** (JC_{tf}).

Staphylinidae: Aleocharinae

Aleochara curtula (Goeze): Wexford **3** (JC_{tf}).

Aleochara lanuginosa Gravenhorst: Carlow **1** (5); Cork **7** (11, 13, 28, 30, 32); Kildare **11** (LD, LH, OPC); Meath **12** (4, 22, 50, GR, GRC); Tipperary **8** (SH, SHC); Waterford **2** (16, 40); Wexford **71** (39, JC, JC_{fm}, JC_{tf}, JCC); Wicklow **1** (26).

Aleochara lygaea (Kraatz): Wexford **1** (JC_{tf}).

Aleochara verna Say: Wexford **1** (JC_{tf}).

Aloconota gregaria (Erichson): Carlow **64** (5, OP); Cork **133** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **150** (LD, LH, LR, OPC); Kilkenny **30** (6, 24, 44, 45); Laois **24** (7); Meath **241** (4, 18, 19, 20, 22, 50, GR, GRC); Tipperary **40** (SH, SHC); Waterford **95** (16, 34, 40, 42, 46); Wexford **274** (1, 2, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **1** (26).

Amischa analis (Gravenhorst): Carlow **198** (5, 23, 47, OP); Cork **545** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **60** (LD, LH, LR, OPC); Kilkenny **314** (6, 24, 44, 45); Laois **24** (7); Meath **749** (3, 4, 18, 19, 20, 21, 22, 50, GR, GRC); Tipperary **86** (SH, SHC); Waterford **695** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **3407** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **390** (10, 25, 26, 27).

Amischa decipiens (Sharp): Carlow **4** (5, 47); Cork **90** (12, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **11** (LD, LR, OPC); Kilkenny **101** (6, 44, 45); Laois **6** (7); Meath **46** (19, 20, 50, GR); Tipperary **15** (SH); Waterford **229** (17, 34, 35, 40, 41, 42, 46); Wexford **413** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **42** (10, 25, 26, 27).

Amischa nigrofusca (Stephens): Cork **22** (29, 30, 31, 32, 33); Kildare **3** (LH);

Kilkenny **8** (24, 44, 45); Laois **4** (7); Meath **31** (18, 19, 20, 22, 50, GR); Waterford **20** (16, 34, 35, 42, 43, 46); Wexford **21** (36, 37, 38, 39, JC_{fm}); Wicklow **2** (26, 27).

Autalia rivularis (Gravenhorst): Cork **3** (11, 31); Kildare **4** (LD, LH); Kilkenny **1** (6); Meath **3** (4, GRC); Tipperary **2** (SH); Wexford **5** (9, 36, 37, JC_{fm}, JC_{tf}); Wicklow **2** (26).

Chaetida longicornis (Gravenhorst): Kildare **4** (LH); Kilkenny **1** (45); Meath **2** (50, GR); Tipperary **1** (SH); Wexford **6** (1, JC_{tf}, JCC).

Drusilla canaliculata (Fabricius): Meath **2** (21, GRC).

Encephalus complicans Stephens: Carlow **4** (OP); Meath **2** (GR); Waterford **2** (35); Wexford **22** (JC_{fm}).

Mocyta fungi (Gravenhorst): Carlow **130** (5, 23, 47, OP); Cork **759** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **271** (LD, LH, LR, OPC); Kilkenny **235** (6, 24, 44, 45); Laois **24** (7); Meath **1623** (3, 4, 18, 19, 20, 21, 22, 50, GR, GRC); Tipperary **90** (SH, SHC); Waterford **689** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **2135** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **275** (10, 25, 26, 27).

Tinotus morion (Gravenhorst): Carlow **1** (47); Kildare **4** (OPC); Meath **1** (4); Wexford **1** (JCC).

Staphylinidae: Micropeplinae

Micropeplus porcatus (Paykull): Meath **1** (GR); Wexford **4** (JC_{tf}).

Micropeplus staphylinoides (Marsham): Kilkenny **1** (44).

Staphylinidae: Omaliinae

Lesteva sicula Erichson: Kildare **1** (LD).

Omalium caesum Gravenhorst: Kildare **1** (OPC).

Staphylinidae: Oxytelinae

Anotylus rugosus (Fabricius): Carlow **16** (5, OP); Kildare **34** (LD, LH, OPC); Meath **55** (GR, GRC); Tipperary **20** (SH, SHC); Wexford **19** (JC, JC_{tf}, JCC).

Anotylus tetracarinatus (Block): Carlow **1** (5); Cork **18** (15, 30, 31, 33); Kildare **2** (LD, LH); Kilkenny **2** (45); Meath **3** (4, 22, GR); Tipperary **3** (SH, SHC); Waterford **3** (41, 42, 46); Wexford **18** (48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow

5 (10, 26, 27).

Carpelimus corticinus (Gravenhorst): Kildare **3** (LD); Meath **3** (4, 18, 19); Waterford **1** (17).

Carpelimus elongatulus (Erichson): Wexford **1** (JC_{tf}).

Carpelimus pusillus (Gravenhorst): Wicklow **1** (26).

Carpelimus rivularis (Motschulsky): Kildare **2** (LD).

Oxytelus laqueatus (Marsham): Kildare **4** (LH, OPC); Meath **2** (GR, GRC); Tipperary **2** (SH); Wexford **12** (JC, JC_{tf}).

Platystethus arenarius (Fourcroy): Carlow **2** (5); Cork **1** (31); Kildare **2** (LH, OPC); Meath **1** (4); Tipperary **16** (SH, SHC); Waterford **3** (40, 43, 46); Wexford **37** (37, 39, JC_{tf}, JCC); Wicklow **1** (26).

Thinobius longipennis (Heer): Wexford **1** (JC_{tf}).

Staphylinidae: Paederinae

Lathrobium brunnipes (Fabricius): Wexford **1** (JC_{tf}).

Lathrobium fulvipenne (Gravenhorst): Tipperary **1** (SH); Wexford **1** (JC_{tf}).

Rugilus orbiculatus (Paykull): Carlow **1** (OP); Wexford **7** (JC_{fm}, JC_{tf}).

Rugilus erichsoni (Fauvel): Meath **7** (21).

Rugilus similis (Erichson): Carlow **5** (5, OP); Cork **1** (32); Meath **3** (19, 20); Wicklow **1** (26).

Sunius propinquus (Brisout): Carlow **2** (OP); Waterford **4** (40, 42); Wexford **34** (36, 37, 39, 48, JC_{fm}, JC_{co}).

Staphylinidae: Proteininae

Megarthrus denticollis (Beck): Meath **2** (22, GR); Wexford **2** (JCC); Wicklow **1** (27).

Megarthrus depressus (Paykull): Kilkenny **1** (24); Meath **2** (GR, GRC); Waterford **1** (41); Wexford **10** (JC_{fm}, JC_{co}, JC_{tf}).

Proteinus brachytperus (Fabricius): Kildare **7** (OPC).

Staphylinidae: Pselaphinae

Reichenbachia juncorum (Leach): Cork **1** (31); Meath **1** (50); Waterford **1** (17).

Rybaxis longicornis (Leach): Waterford **1** (35); Wexford **1** (49).

Tychus niger (Paykull): Carlow **1** (5); Wexford **3** (1, 37, 38).

Staphylinidae: Staphylininae

Bisnius nigriventris (Thomson, C. G.): Wexford **2** (JC_{fm}).

Bisnius puella (Nordmann): Meath **1** (GRC).

Bisnius sordidus (Gravenhorst): Meath **1** (GRC); Wexford **3** (39, JC, JC_{tf}).

Gabrius appendiculatus Sharp: Carlow **8** (47, OP); Cork **7** (11, 28, 31); Kildare **2** (OPC); Kilkenny **1** (44); Meath **35** (4, 21, 22, 50, GR, GRC); Tipperary **3** (SHC); Waterford **2** (34, 42); Wexford **9** (JC_{fm}, JC_{co}, JC_{tf}).

Gabrius breviventer (Sperk): Cork **1** (32); Kilkenny **1** (45); Meath **4** (GR, GRC); Tipperary **1** (SH); Waterford **3** (34, 35); Wexford **6** (1, JC, JC_{fm}, JC_{tf}, JCC).

Gyrohypnus angustatus Stephens: Carlow **1** (OP); Kildare **1** (LD); Wexford **3** (JCC).

Gyrohypnus fracticornis (Müller, O.F.): Carlow **1** (OP); Kildare **3** (LD, OPC); Tipperary **2** (SH, SHC); Wexford **36** (39, JC, JC_{tf}, JCC).

Megalinus glabratus (Gravenhorst): Carlow **2** (OP); Kildare **5** (OPC); Wexford **43** (JC_{tf}, JCC).

Ocypus aeneocephalus (De Geer): Wexford **2** (JC_{tf}).

Ocypus fuscatus (Gravenhorst): Carlow **4** (OP); Kildare **1** (LH); Meath **1** (GR); Tipperary **4** (SH, SHC); Wexford **1** (JC).

Ocypus olens (Müller): Wexford **14** (JC_{tf}).

Othius angustus Stephens: Meath **3** (GRC).

Othius subuliformis Stephens: Kildare **1** (LH).

Ontholestes murinus (Linnaeus): Wexford **1** (JC_{tf}).

Philonthus addendus Sharp: Kildare **1** (LD); Tipperary **1** (SH).

Philonthus albipes (Gravenhorst): Meath **1** (GRC).

Philonthus carbonarius (Gravenhorst): Carlow **44** (5, OP); Cork **47** (11, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **28** (LD, LH, OPC); Kilkenny **12** (6, 24, 44, 45); Meath **41** (3, 4, 19, 20, 22, 50, GR, GRC); Tipperary **44** (SH, SHC); Waterford **27** (16, 17, 34, 40, 41, 42, 43, 46); Wexford **466** (1, 2, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **4** (26, 27).

Philonthus cognatus Stephens: Carlow **178** (5, 23, OP); Cork **12** (11, 28, 29, 31, 32, 33); Kildare **52** (LD, LH, LR, OPC); Kilkenny **7** (6, 44, 45); Meath **49** (19, 50, GR, GRC); Tipperary **234** (SH, SHC); Waterford **21** (34, 35, 40, 41, 42, 46); Wexford **2430** (9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **7** (25, 26).

Philonthus cruentatus (Gmelin in Linnaeus): Cork **1** (14).

Philonthus intermedius (Lacordaire): Meath **2** (GR); Tipperary **1** (SHC); Wexford **6** (JC, JC_{tf}, JCC).

Philonthus laminatus (Creutzer): Carlow **381** (23, OP); Cork **2** (11, 31); Kildare **69** (LD, LH, OPC); Meath **26** (21, 22, GR, GRC); Tipperary **26** (SH, SHC); Waterford **7** (40, 41); Wexford **672** (36, 37, 48, JC, JC_{fm}, JC_{tf}, JCC); Wicklow **1** (10).

Philonthus marginatus (Müller): Kildare **15** (LD, LH, OPC); Meath **14** (4, 21, 22, 50, GR, GRC); Tipperary **13** (SH, SHC); Waterford **1** (16); Wexford **135** (49, JC, JC_{tf}, JCC); Wicklow **1** (26).

Philonthus sanguinolentus (Gravenhorst): Wexford **5** (38, JC, JC_{tf}).

Philonthus splendens (Fabricius): Cork **1** (31); Kildare **3** (LH); Meath **1** (GR); Wexford **33** (JC, JC_{tf}, JCC).

Philonthus succicola Thomson, C. G.: Wexford **2** (JC_{tf}).

Philonthus tenuicornis Mulsant and Rey: Wexford **1** (JC_{co}).

Philonthus varians (Paykull): Cork **2** (28, 30); Kildare **3** (OPC); Kilkenny **1** (44); Meath **3** (4, 22, GR); Waterford **1** (40); Wexford **35** (1, 48, JC, JC_{fm}, JC_{tf}, JCC).

Quedius fuliginosus (Gravenhorst): Carlow **1** (OP); Wexford **2** (JC_{tf}).

Quedius levicollis (Brullé): Carlow **5** (5, 47, OP); Kildare **7** (LD, OPC); Meath **6** (GR, GRC); Tipperary **3** (SH, SHC); Wexford **94** (JC, JC_{tf}, JCC).

Quedius nigriceps Kraatz: Carlow **1** (OP).

Quedius nitipennis (Stephens): Kilkenny **1** (44); Meath **1** (GR).

Quedius schatzmayri Gridelli: Carlow **5** (OP); Cork **1** (14); Kildare **3** (LD, LH); Meath **8** (3, GR); Tipperary **4** (SH, SHC); Waterford **1** (35); Wexford **24** (1, 37, 49, JC, JC_{fm}, JC_{tf}, JCC).

Quedius semiobscurus (Marsham): Wexford **8** (JC_{fm}, JC_{co}, JC_{tf}).

Staphylinus dimidiaticornis Gemminger: Tipperary **1** (SHC); Waterford **1** (40); Wexford **16** (JC, JC_{tf}).

Xantholinus linearis (Olivier): Carlow **13** (OP); Kildare **12** (LD, LH, LR, OPC); Kilkenny **2** (44); Meath **5** (50, GR, GRC); Tipperary **5** (SH, SHC); Wexford **14** (36, JC, JC_{fm}, JC_{co}, JC_{tf}).

Xantholinus longiventris Heer: Carlow **9** (5, OP); Cork **1** (33); Kildare **3** (OPC); Meath **4** (19, GR, GRC); Tipperary **9** (SH, SHC); Waterford **5** (42, 46); Wexford **84** (1, 36, 38, 39, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **1** (27).

Staphyinidae: Steninae

Stenus ater Mannerheim: Wexford **1** (JC_{tf}).

Stenus bimaculatus Gyllenhal: Wexford **1** (JC_{tf}).

Stenus brunnipes Stephens: Carlow **7** (47, OP); Cork **11** (15, 28, 29, 32, 33); Kildare **15** (LD, LH, LR, OPC); Kilkenny **4** (6, 44, 45); Meath **79** (3, 4, 18, 19, 20, 21, 50, GR, GRC); Tipperary **11** (SH); Waterford **6** (16, 42, 43, 46); Wexford **32** (2, 8, 37, 48, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **2** (27).

Stenus canaliculatus Gyllenhal: Cork **9** (14, 15, 28, 32); Kildare **2** (LD); Meath **16** (3, 20, 22, GR); Tipperary **8** (SH, SHC); Waterford **1** (46); Wexford **9** (JC_{co}, JC_{tf}).

Stenus cicindeloides (Schaller): Carlow **42** (47, OP); Cork **20** (11, 12, 13, 28, 31, 32, 33); Kildare **2** (LD, LR); Kilkenny **2** (44); Laois **3** (7); Meath **21** (3, 4, 18, 20, 50, GR); Waterford **8** (16, 17, 34, 35, 42, 46); Wexford **50** (1, 8, 39, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **10** (26, 27).

Stenus clavicornis (Scopoli): Carlow **27** (5, 47, OP); Cork **78** (11, 12, 13, 15, 28, 29, 30, 31, 32, 33); Kildare **29** (LD, LH, LR, OPC); Kilkenny **10** (6, 24, 44, 45); Laois **1** (7); Meath **84** (3, 4, 18, 19, 21, 22, 50, GR, GRC); Tipperary **3** (SH, SHC); Waterford **29** (16, 17, 34, 35, 41, 42, 43, 46); Wexford **82** (1, 2, 8, 9, 39, 48, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **17** (10, 25, 26, 27).

Stenus formecitorum Mannerheim: Carlow **13** (5, 23, OP); Cork **58** (11, 12, 13, 15, 28, 29, 30, 31, 32, 33); Kildare **150** (LD, LH, OPC); Kilkenny **11** (6, 44, 45); Laois (7); Meath **288** (3, 4, 19, 20, 22, 50, GR, GRC); Tipperary **127** (SH, SHC);

Waterford **27** (16, 17, 34, 40, 42, 46); Wexford **164** (9, 39, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **2** (26).

Stenus fulvicornis Stephens: Cork **3** (13, 33); Kildare **9** (LD, LH, LR); Kilkenny **2** (24, 45); Meath **4** (4, 19, 21, GRC); Tipperary **2** (SH); Waterford **1** (17); Wexford **153** (2, 8, 48, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **5** (10, 27).

Stenus juno (Paykull): Cork **15** (12, 28, 30); Kildare **1** (LR); Meath **4** (22, GR); Waterford **5** (17, 34, 35); Wicklow **1** (25).

Stenus nanus Stephens: Carlow **5** (5, 23, 47); Cork **48** (11, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **49** (LD, LH, LR, OPC); Kilkenny **4** (6, 24, 45); Meath **152** (3, 18, 19, 20, 22, 50, GR, GRC); Tipperary **25** (SH, SHC); Waterford **8** (16, 34, 41, 46); Wexford **81** (1, 2, 8, 9, 36, 37, 39, 48, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **17** (10, 25, 26, 27).

Stenus ossium Stephens: Cork **1** (31); Kildare **1** (OPC); Kilkenny **1** (44); Meath **1** (GR); Tipperary **2** (SH); Waterford **27** (16, 17, 35, 41, 43); Wexford **192** (JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **24** (10, 27).

Stenus picipes Stephens: Carlow **6** (5, 23, OP); Cork **111** (11, 12, 13, 15, 28, 29, 30, 31, 32, 33); Kildare **33** (LD, LH, LR); Kilkenny **16** (6, 24, 44, 45); Laois **1** (7); Meath **134** (3, 4, 19, 20, 21, 22, 50, GR, GRC); Waterford **74** (16, 17, 34, 35, 41, 43, 46); Wexford **63** (1, 2, 8, 9, 37, 48, JC, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **27** (10, 25, 26, 27).

Stenus similis (Herbst): Cork **13** (12, 13, 14, 15, 30, 31, 33); Kildare **3** (LR); Meath **17** (21, GR, GRC); Waterford **5** (34, 46); Wexford **20** (36, JC_{fm}, JC_{co}, JC_{tf}); Wicklow **2** (26).

Stenus tarsalis Ljungh: Cork **134** (11, 12, 28, 29, 30, 31, 32); Meath **3** (50); Tipperary **1** (SH).

Staphylinidae: Tachyporinae

Mycetoporus lepidus (Gravenhorst): Wexford **3** (JC_{co}).

Ischnosoma longicorne (Mäklin): Carlow **1** (47).

Ischnosoma splendidum (Gravenhorst): Laois **1** (7); Waterford **1** (41); Wexford **2** (1, JCC).

Sepedophilus nigripennis (Stephens): Kilkenny **1** (44); Wexford **93** (1, JC_{fm}).

Tachinus laticollis Gravenhorst: Carlow **59** (OP); Cork **2** (13, 32); Kildare **28** (LD, LH, OPC); Kilkenny **1** (44); Meath **10** (22, GR, GRC); Tipperary **5** (SH, SHC); Wexford **41** (JC_{co}, JC_{tf}, JCC); Wicklow **1** (27).

Tachinus marginellus (Fabricius): Carlow **3** (OP).

Tachinus rufipes (Linnaeus): Carlow **94** (23, OP); Cork **12** (12, 28, 29, 30, 31); Kildare **21** (LD, LH); Kilkenny **11** (6, 24); Meath **15** (22, GR, GRC); Tipperary **70** (SH, SHC); Waterford **11** (16, 17, 35, 42, 46); Wexford **67** (1, 2, 37, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **5** (26, 27).

Tachyporus chrysomelinus (Linnaeus): Carlow **12** (5, OP); Cork **49** (11, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **5** (LH, LR); Kilkenny **15** (6, 24, 44, 45); Meath **36** (19, 20, 50, GR); Tipperary **4** (SH, SHC); Waterford **30** (34, 35, 40, 41, 42, 46); Wexford **137** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **9** (10, 26).

Tachyporus dispar (Paykull): Carlow **14** (5, 23, 47, OP); Cork **37** (12, 13, 15, 28, 29, 30, 31, 32, 33); Kilkenny **23** (6, 24, 44, 45); Laois **2** (7); Meath **21** (3, 4, 19, 20, 21, 22, GR, GRC); Tipperary **8** (SH, SHC); Waterford **58** (16, 17, 34, 35, 40, 41, 42, 43, 46); Wexford **232** (1, 2, 8, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **17** (10, 25, 26, 27).

Tachyporus hypnorum (Fabricius): Carlow **7** (5, OP); Cork **19** (11, 14, 15, 29, 30, 31, 32, 33); Kildare **13** (LD, LH, LR, OPC); Kilkenny **2** (44); Laois **2** (7); Meath **16** (4, 19, 20, 50, GR); Waterford **12** (34, 40, 41, 46); Wexford **148** (9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{co}, JC_{tf}, JCC); Wicklow **6** (26).

Tachyporus nitidulus (Fabricius): Carlow **2** (47); Cork **6** (15, 33); Kildare **2** (LR, OPC); Kilkenny **3** (24); Meath **7** (GR, GRC); Tipperary **5** (SH, SHC); Waterford **11** (34, 40, 43); Wexford **29** (2, 36, 37, 38, 39, JC, JC_{fm}, JC_{tf}).

Tachyporus obtusus (Linnaeus): Carlow **3** (5, OP); Cork **1** (33); Kildare **3** (LR); Kilkenny **1** (44); Meath **2** (GR); Wexford **15** (1, 39, JC_{fm}, JC_{co}, JC_{tf}).

Tachyporus pallidus Sharp: Wexford **5** (JC_{co}, JCC).

Tachyporus pusillus Gravenhorst: Carlow **36** (5, 23, 47, OP); Cork **42** (11, 13, 14,

15, 28, 31, 32, 33); Kildare **12** (LD, LH, LR, OPC); Kilkenny **22** (6, 24, 44, 45); Laois **3** (7); Meath **106** (3, 4, 18, 19, 20, 21, 22, 50, GR, GRC); Tipperary **10** (SH, SHC); Waterford **42** (16, 17, 34, 40, 41, 42, 43, 46); Wexford **212** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, JC, JC_{fm}, JC_{tf}, JCC); Wicklow **8** (10, 25, 26)

Tachyporus scitulus Erichson: Wexford **1** (JC_{fm}).

Tachyporus solutus Erichson: Meath **2** (50, GR); Waterford **2** (17, 42); Wexford **6** (JC_{fm}, JC_{co}); Wicklow **2** (26, 27).

Tachyporus tersus Erichson: Cork **1** (32); Kildare **1** (LD); Meath **1** (GR).

Two species were ubiquitous, being found at all 64 sites. These were *Amischa analis* and *Mocyta fungi*, both of which are small staphylinid beetles of the sub-family Aleocharinae. This sub-family is widely considered to be very difficult to identify and many studies have avoided identifying them entirely (Good, 1988). It is therefore likely that information regarding the incidence and distribution of many species may be particularly limited. In this study, only readily identifiable aleocharine species were fully identified, with the majority allocated to genus and/or morphospecies.

In their study of Staphylinidae in cereal and grass fields in south-west Ireland, Good and Giller (1990) also found *M. fungi* to be almost ubiquitous with records from 96% of sites, and *A. analis* found at 57% of their 49 locations. Two other aleocharine species were also found to be very widespread. These were *Aloconota gregaria* and *Amischa decipiens*, which were found at 52 (81%) and 49 (77%) sites, respectively.

Fourteen other species of Coleoptera from several different families were found at more than 70% of sites. These included two species of Carabidae, *Bembidion lampros* (80%) and *Pterostichus strenuus* (75%), both of which are described by Luff (2007) as widespread and abundant, and have been reported elsewhere as common in pastures (Desender *et al.*, 1981, 1984, 1989). The clover feeding weevil *Sitona lepidus* (Curculionidae) was found at 72% of sites, and is known to be widespread in Ireland (Morris, 1997). *Megasternum concinnum*

(Hydrophilidae), which inhabits dung (Hanski and Koskela, 1977), was also widespread, being found at 88% of sites, and three species of feather-winged beetles (Ptiliidae):- *Acrotrichis atomaria* (73%), *Ptenidium nitidum* (75%) and *P. pusillum* (90%) were also widespread and generally abundant. Very frequent staphylinid beetles included *Philonthus carbonarius* (sub-family Staphylininae) (80%), three species of the subfamily Steninae and three species of the Tachyporinae. *P. carbonarius* has previously been known as *P. varius* and has been recognised as abundant in pastures including those heavily grazed (D'Hulster and Desender, 1982, 1984; de Keer *et al*., 1986; Good, 1988; Good and Giller, 1988). The most commonly encountered Steninae were *Stenus clavicornis* (88%), *S. nanus* (80%) and *S. picipes* (80%), all of which were described by Anderson (1984) as widespread in Ireland. *S. clavicornis* was also found by Good and Giller (1988) to be abundant in Irish pastures. The three most widespread tachyporine species were, *Tachyporus chrysomelinus* (72%), recognised previously as common in pastures (Good and Giller, 1988; Green, 1953), *T. dispar* (86%) and *T. pusillus* (91%).

A further 12 coleopteran species were found at between 34 (53%) and 45 (70%) of sites. These included: two further clover-feeding weevils, *Ischnopterapion virens* (67%) and *Protapion fulvipes* (56%), both of the family Apionidae and both known to be common in Ireland (Morris, 1990); the carabid *Bembidion guttula* (59%), which has been described as very abundant and ubiquitous by Luff (2007); three species of Cryptophagidae from the genus *Atomaria*, *A. apicalis* (56%), *A. atricapilla* (56%) and *A. nitidula* (63%) and *Enicmus histrio* (55%) from the family Latridiidae. Both *A. atricapilla* and *E. histrio* were abundant in agricultural grasslands studied by Curry and O'Neill (1979). This group of widely occurring species also included: *Philonthus cognatus* (66%) (Staphylininae), which has been described as common in pastures (Desender *et al*., 1984; Good and Giller, 1988, 1991); three further *Stenus* species, *S. brunnipes* (58%), *S. cicindeloides* (53%), both of which are widespread and common, and *S. formecitorum* (70%), which has been thought as uncommon in

Ireland (Anderson, 1984); and finally *Tachyporus hypnorum* (59%), which previously has been noted as abundant in agricultural grasslands (Curry and O'Neill, 1979).

A number of species were found in only a small number of sites and in relatively small numbers, but in reality, were probably much more common. For example, dung feeding beetles such as the Aphodiinae were only found at one location but were doubtless present at most if not all the sites, given that all were grazed grasslands. The chances of collecting such species would have been small, however, due to the deliberate avoidance of dung patches when suction sampling, and the use of unbaited pitfall traps. Probably for similar reasons, many of the *Cercyon* species, which are also closely associated with dung (Hanski, 1980; Hanski and Koskela, 1979), were relatively infrequently encountered. Interestingly, the lack of Aphodiinae and *Cercyon* records contrast with the much greater incidence of *Megasternum concinnum*, which is also generally thought to be associated with dung, but has a wider habitat niche breadth and is more associated with comparatively old dung (Hanski, 1980; Hanski and Koskela, 1977).

Similarly, some plant specific species associated with plants that are common within agricultural grasslands may have been infrequently sampled. These include the brightly coloured *Rumex* feeding chrysomelid *Gastrophysa viridula* (Salt and Whittaker, 1998), which was seen in many more grasslands than it was sampled from. This may be because *Rumex* is very common in agricultural grasslands but usually only covers a relatively small area of the field and therefore is unlikely to be sampled using a random point sampling regime. Another *Rumex* specialist for which this may be the case is the Curculionidae weevil, *Hypera rumicis*, which has very distinctive and unusual pupal structures that can often be found on *Rumex* in agricultural grasslands (Salt and Whittaker, 1998).

Other species may be common in habitats closely associated with field margins, rather than agricultural grassland *per se*. This may well be the case for the Cantharidae (soldier beetles), which were frequently seen, but were rarely

collected in a sampling programme designed to evaluate biodiversity within field interiors under the influence of agricultural management.

A couple of notable species were recorded. Three specimens of *Polydrusus formosus* (Curculionidae) were found at Johnstown Castle in Co. Wexford. Although discovered at only one site, these specimens represent the first record of this species in Ireland (Helden, 2005). Another unexpected record was that of the introduced weevil *Euophryum confine*. This species feeds on dead wood and is common in open habitats such as hedgerows. Although not commonly reported from the Irish Republic, it is probably widespread throughout the country (Morris, 2002).

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ARTHROPOD BIODIVERSITY OF AGRICULTURAL GRASSLAND IN SOUTH AND EAST IRELAND: PARASITOID HYMENOPTERA

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Abstract

A total of 170 genera of parasitoid Hymenoptera were collected from lowland agricultural grasslands in the south-east of Ireland during the Ag-Biota project. Due to time constraints, large numbers of samples collected and identification difficulties, it was possible to make only a limited number of reliable species identifications. A total of 67 species were identified and are listed, together with details of the sites where they were found and an indication of their relative abundance in each county. From the samples, three genera and nine species were new Irish records.

Introduction

This paper focuses on the parasitoid Hymenoptera and is one of a series of four publications detailing the incidence and diversity of arthropod populations recorded in agricultural grasslands collected from the Ag-Biota Project, which was funded by the EPA from 2002- 2006 (Purvis *et al*., 2005).

Methods

Parasitoid Hymenoptera were collected from grassland vegetation using a Vortis suction sampler at all sites, and in addition by sweep netting at Johnstown Castle, Co. Wexford. Further details of these methods and the sites sampled (including the site abbreviations used here) can be found in Anderson *et al*. (2008). Identification to genus, and species where possible, were made using the following sources:- Braconidae, Alysiinae (Wharton, 1997a); Braconidae, Aphidiinae (Achterberg, 1997); Braconidae, Microgastrinae (Whitfield, 1997); Diapriidae, Diapriinae (Nixon, 1980); Dryinidae (Tryapitsyn, 1987); Encyrtidae (Noyes *et al*., 1997); Eulophidae, Eulophinae (Askew, 1968a); Figitidae, Charipinae (Fergusson, 1986); Figitidae, Eucoilinae (Quinlan, 1978); Figitidae, Figitinae (Fergusson, 1986); Ichneumonidae, Adelognathinae (Townes, 1969); Ichneumonidae, Campopleginae (Townes, 1970b); Ichneumonidae, Cryptinae (Townes, 1970a); Ichneumonidae, Diplazontinae (Fitton and Rotheray, 1982); Ichneumonidae, Ichneumoninae, (Perkins, 1960); Ichneumonidae, Pimplinae (Fitton *et al.*, 1988); Ichneumonidae, Tersilochinae (Townes, 1971); Megaspilidae (Alekseev, 1987; Fergusson, 1980) and Pteromalidae (Bouček and Rasplus, 1991). In general, because of the relative difficulty associated with parasitoid identification, and the large number of samples and individuals collected, most identifications were taken only to genus, but where possible, taxa were identified to species. Species identifications for Braconidae and Ichneumonidae were determined by Dr Gavin Broad (Natural History Museum, London); Pteromalidae by Hannes Baur (Natural History Museum, Bern, Switzerland) and Encyrtidae by Dr John Noyes (Natural History Museum, London). Voucher specimens of new Irish records were lodged in the National Museum of Ireland.

Results

Over the five years of the project a total of 34,143 individuals representing 170 genera of parasitoid Hymenoptera from 18 families were recorded in samples from ten counties. In total, 67 species were identified from the 170 genera and details of

their distribution and relative abundance in samples are given here. Despite the constraints of limited time to fully identify many specimens, this list gives an indication of the diversity of these insects within agricultural grasslands of south-east Ireland. Two braconid genera are also included in the list as they were new records for Ireland.

In the following list of the species collected, the total abundance of individuals recorded in each county is given in bold, and the sites within each county in which they were recorded are given in parentheses. Location details are provided in Anderson *et al*. (2008). New Irish records are indicated by *.

Braconidae, Alysiinae

Dinotrema speculum (Haliday): Kildare **1** (OPC).

Pentapleura pumilio (Nees): Wexford **67** (JC, $JC_{fm,}$).

Braconidae, Aphidiinae

Diaeretellus ephippium (Haliday): Meath **1** (18); Wexford **6** (JC_{fm}) (Anderson *et al*., 2006).

Diaeretiella rapae (McIntosh): Wexford **3** (JC_{fm}).

Monoctonus Haliday: Carlow **2** (5); Cork **71** (11, 12, 13, 15, 28, 30, 31, 32, 33); Kildare **20** (L); Kilkenny **6** (6, 44, 45); Laois **2** (7); Meath **74** (3, 4, 18, 19, 20, 21, 22, 50, GR); **11** Tipperary (SH), Waterford **13** (16, 34, 35, 40, 43); Wexford **191** (4, 8, 36, 37, 38, 39, 49, JC_{fm} (Anderson *et al*., 2006), JC_{co}, $JC_{to)}$; Wicklow **10** (26, 27).

Braconidae, Blacinae **New to Ireland**

*****_Blacus ambulans_ Haliday: Cork **1** (12); Wexford **19** (JC_{fm}).

Braconidae, Microgastrinae

Glyptapanteles Ashmead: Cork **1** (29); Wexford **1** (JC_{fm}) (Anderson *et al*., 2006).

*****_Sathon falcatus_ (Nees): Wexford **1** (JC_{fm}) **New to Ireland**

Diapriidae, Diapriinae

Basalys orion Nixon: Kildare **1** (L.).

Labolips innupta Haliday: Cork **2** (11, 28); Meath **1** (19); Wexford **1** (8).

Dryinidae

Gonatopus bicolor (Haliday): Meath **1** (GRC); Wexford **8** (JC_{fm}).

Encyrtidae, Tetracneminae

Anagyrus belibus (Walker): Wexford **3** (JC).

Lamennaisia ambigua (Nees): Meath **1** (GR); Wexford **1** (42).

*****_Rhopus acaetes_ (Walker): Wexford **2** (JC_{fm}) **New to Ireland**

Eulophidae, Eulophiinae

Diglyphus isaea (Walker): Carlow **8** (23, 47, OP); Cork **74** (11, 13, 15, 28, 29, 30, 31, 32, 33); Kildare **77** (L, OPC); Kilkenny **15** (6, 24, 44, 45); Meath **52** (18, 19, 20, 21, 22, 50, GR); Tipperary **15** (SH, SHC); Waterford **156** (16, 17, 34, 35, 40, 41, 42, 45, 46); Wexford **197** (1, 9, 36, 37, 38, 39, 48, 49, JC, JC_{co}, JC_{fm}, JCC); Wicklow **10** (25, 26).

Hemiptarsenus ornatus (Nees): Cork **1** (12); Waterford **1** (43); Wexford **7** (JC_{fm}).

Hemiptarsenus fulvicollis Westwood: Meath **1** (21); Wexford **2** (JC_{fm}); Wicklow **6** (26, 27).

Hemiptarsenus unguicellus (Zetterstedt): Carlow **12** (5, OP); Cork **31** (28, 31); Kildare **20** (L, OPC); Meath **9** (3, 21, 22, GR); Tipperary **7** (SH); Waterford **13** (34, 42); Wexford **130** (1, 8, 36, 37, 39, $JC_{co,}$ $JC_{fm,}$ JC_{to}); Wicklow **4** (26, 27).

Figitidae, Charipinae

Alloxysta abdera Fergusson: Kildare **2** (L); Meath **1** (GR); Tipperary **1** (SHC); Wexford **2** (JC).

Alloxysta brachyptera (Hartig): Cork **2** (11); Meath **3** (22, GR); Wexford **21** (JC, $JC_{fm,}$ JC_{to}).

Alloxysta brevis (Thomson): Carlow **1** (OP): Wexford **32** (JC, $JC_{fm,}$ JC_{to}).

Alloxysta macrophadna (Hartig): Carlow **14** (OP); Cork **9** (31); Kildare **13** (L); Meath **32** (18, 22, GR); Tipperary **8** (SH, SHC); Wexford **92** (37, JC, $JC_{fm,}$ $JC_{to,}$ JCC); Wicklow **9** (10, 26).

Phaenoglyphus villosa (Hartig): Cork **1** (28); Kildare **15** (L, OPC); Kilkenny **2** (24, 44); Meath **9** (GR); Tipperary **2** (SH); Waterford **6** (35, 42); Wexford **11** (JC, $JC_{fm,}$ JC_{to}).

Figitidae, Eucoilinae

Rhoptromeris heptoma (Hartig): Carlow **2** (47); Cork **22** (11, 12, 13, 15, 30, 31, 32); Kildare **10** (OPC); Kilkenny **19** (6, 24, 44, 45); Meath **27** (3, 4, 18, 19, 20, 21, 22, GR); Waterford **10** (17, 35, 41); Wexford **52** (1, 2, 8, 9, 37, 49, JC_{co}, JC_{fm}); Wicklow **9** (25, 26, 27).

Figitidae, Figitinae

Sarothrus tibialis (Zetterstedt): Kildare **2** (L); Meath **1** (50); Wexford **3** (JC_{fm}).

Ichneumonidae, Adelognathinae

Adelognathus dorsalis (Gravenhorst): **2** Wexford (JC_{fm}).

Ichneumonidae, Campopleginae

Campoletis annulata (Gravenhorst): Meath **1** (GR); Wexford **1** (JC_{to}).

Diadegma litorale (Holmgren): Wexford **2** (JC_{fm}).

Ichneumonidae, Cryptinae

Aclastus minutus (Bridgman): Carlow **1** (L) (Anderson *et al*., 06); Kildare **2** (L).

Aclastus solutus (Thomson): Meath **1** (22); Wexford **12** (8, JC); Wicklow **1** (26).

Aritranis director (Thunberg): Wexford **2** (JC_{fm}).

Gambrus ornatus (Gravenhorst): Wexford **1** (JC_{fm}) (det. M. Schwarz).

Ichneumonidae, Diplazontinae

Promethes sulcator (Gravenhorst): Cork **1** (32); Tipperary **1** (SH); Wexford **1** (JC_{fm}).

Sussaba dorsalis (Holmgren): Meath **1** (GR); Tipperary **1** (SH).

Ichneumonidae, Ichneumoninae

Epitomus infuscatus (Gravenhorst): Wexford **1** (JC_{fm}).

Limerodops elongatus (Brischke): Wexford **2** (JC_{fm}).

Ichenumonidae, Pimplinae

Tromatobia variabilis (Holmgren): Wexford **1** (JC_{fm}).

Ichneumonidae, Tersilochinae

Probles (*Microdiaparsis*) *neoversutus* (Horstmann): Wexford **1** (JC_{fm}).

Megaspilidae, Megaspilinae

Dendrocerus aphidum (Rondani): Carlow **2** (OP); Cork **38** (11, 12); Kildare **17** (L,

OPC); Meath **32** (GR, GRC); Tipperary **1** (SH); Wexford **54** (39, JC, $JC_{fm,}$ JC_{to}).

Dendrocerus carpenteri (Curtis): Meath **2** (GR); Wexford **4** (JC).

Dendrocerus rectangularis (Kieffer) [=*dubiosus* (Kieffer)]: Kildare **4** (L, OPC); Meath **11** (GR); Wexford **45** (JC, $JC_{fm,}$ JC_{to}).

Dendrocerus laticeps (Hedicke): Carlow **1** (OP); Kildare **5** (L, OPC); Meath **6** (GR); Wexford **28** ($JC_{fm,}$ JC_{to}).

Pteromalidae, Asaphinae

Asaphes suspensis (Nees): Kildare **2** (L, OPC) (Anderson *et al*, 2006); Meath **20** (GR); Tipperary **2** (SH); Wexford **24** (JC, JC_{fm}).

Asaphes vulgaris Walker: Wexford **4** (JC_{fm}).

Pteromalidae, Miscogasterinae

Halticoptera aenae (Walker): Kildare **1** (L); Wexford **2** (JC_{fm}).

Halticoptera circulus (Walker): Wexford **46** (JC, $JC_{fm,}$ JC_{co}).

Merismus rufipes Walker: Wexford **6** (JC_{fm})* (Anderson *et al*., 2006).

Miscogaster maulata Walker: Kildare **1** (L); Wexford **2** (JC_{fm}).

Thinodytes cyzicus (Walker): Wexford **23** (JC_{fm}).

Pteromalidae, Panstenoninae

Panstenon oxylus (Walker): Cork **2** (28, 31); Waterford **2** (40); Wexford **391** (49, JC, $JC_{co,}$ $JC_{fm,}$ JC_{to}); Wicklow **1** (27).

Pteromalidae, Pteromalinae

Callitula pyrrhogaster (Walker): Carlow **1** (5); Cork **3** (29, 32, 33); Kilkenny **5** (24, 44, 45); Waterford **7** (35, 40, 41, 45); Wexford **141** (2, 37, 38, 48, 49, JC, $JC_{co,}$ JC_{fm}); Wicklow **26** (10, 27).

Chlorocytus formosus (Walker): Cork **1** (13); Wexford **3** (9, JC_{fm}); Wicklow **1** (27).

Cyrtogaster vulgaris Walker: Carlow **36** (5, 23, 47, OP); Cork **278** (11, 12, 13, 14, 15, 28, 29, 30, 31, 32, 33); Kildare **23** (L, OPC); Kilkenny **83** (6, 24, 44, 45); Laois **2** (7); Meath **157** (3, 4, 18, 19, 20, 21, 22, 50, GR); Tipperary **11** (SH); Waterford **261** (16, 17, 34, 35, 40, 41, 42, 45, 46); Wexford **323** (1, 2, 8, 9, 36, 37, 38, 39, 48, 49, $JC_{co,}$ $JC_{fm,}$ JC_{to}); Wicklow **33** (10, 25, 26, 27).

Homoporus febriculosis (Girault): Wexford **1** (JC_{fm}) (Anderson *et al*., 2006).
Homoporus luniger (Nees): Wexford **1** (JC_{fm}).
Meraporus graminocola (Walker): Carlow **86** (23, 47, OP); Cork **10** (12, 28, 32, 33); Kildare **40** (L, OPC); Kilkenny **1** (6); Laois **1** (7); Meath **140** (3, 18, 21, GR, GRC); Tipperary **12** (SH); Waterford **40** (17, 34, 35, 45); Wexford **226** (36, 37; 49, JC, $JC_{co,}$ $JC_{fm,}$ JC_{to}); Wicklow **20** (10, 25, 26).
Mesopolobus aequus (Walker): Cork **1** (28); Kildare **2** (L); Kilkenny **1** (24); Meath **4** (19, 21); Tipperary **1** (SH); Waterford **2** (34); Wexford **35** (JC, JC_{fm}).
Mesopolobus diffinis (Walker): Wexford **2** (JC_{fm}).
Mesopolobus laticornis (Walker): Wexford **24** (JC_{fm}).
Spaniopus dissimilis Walker: Cork **2** (15, 31); Meath **1** (GR); Waterford **5** (16, 34, 35); Wexford **49** (49, $JC_{fm,}$ JC_{co}).
Spintherus dubius (Nees): Wexford **9** (JC_{fm}) (Anderson *et al*., 2006).
Stenomalina gracilis Walker: Meath **1** (GR).
Toxeuma fuscicorne Walker: Kildare **1** (L); Wexford **5** (JC).
Trichomalopsis hemiptera (Walker): Wexford **7** (JC_{fm}).
Trichomalus campestris (Walker): Cork **1** (28); Kildare **1** (L); Meath **1** (18, GR); Wexford **6** (JC_{fm}).
Trichomalus rufinus (Walker): Carlow **2** (OP); Wexford **3** (JC_{fm}).
Trichomalus gynetelus Walker: Carlow **1** (OP).

Discussion

The most abundant species collected were *Cyrtogaster vulgaris* (Pteromalidae) found at 58 of the 64 sites, *Meraporus graminocola* (Pteromalidae) at 31 of the 64 sites, *Rhoptromeris heptoma* (Figitidae) at 35 of the 64 sites and *Diglyphus isaea* (Eulophidae) at 50 of the 64 sites. Three genera, *Monoctonus*, *Diaretellus* and *Glyptapanteles*, and nine species, *Aclastus minutus, Diaeretellus ephippium*, *Blacus ambulans, Sathon falcatus*, *Asaphes suspensis, Merismus rufipes, Homoporus febriculosis, Spintherus dubius* and *Rhopus acaetes* were found to be new to Ireland. With the exception of *B. ambulans*, *S. falcatus* and *R. acaetes,*

details of the above are available in Anderson *et al*. (2006). *B. ambulans*, *S. falcatus* and *R. acaetes* were all collected from the manipulated field margin experiment at Teagasc, Johnstown Castle (T022172), Co. Wexford. A female *B. ambulans* specimen was collected on 14 June 2004 from a suction sample and a female *S. falcatus* was collected from a sweep net sample on 9 August 2004. Both specimens were collected from a field margin plot that had been rotavated, allowed to naturally revegetate and fenced to prevent grazing and external farming inputs. A single, apterous female *R. acaetes* was collected from a grazed field adjacent to a fenced field margin on 14 June 2004.

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FIRST RECORDS OF *LEPTOGAMASUS* (*LEPTOGAMASUS*) *OBESUS* (HOLZMANN, 1969) AND *LEPTOGAMASUS* (*VALIGAMASUS*) *PANNONICUS* (WILLMANN, 1951) (ACARI: GAMASIDA: PARASITIDAE) IN IRELAND

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Comparatively little is known of the invertebrate fauna of forests in Ireland. The work reported in this paper is part of a major study of the mite communities in arboreal and edaphic niches from Sitka spruce (*Picea sitchensis*) plantations in Ireland. Sitka spruce is a North American species but is predominant in Irish plantation forests.

A survey of the Acarina fauna was carried out in a first rotation (17 years old) Sitka spruce forest located in Dooary, Co. Laois). This site (S504880; 260m a.s.l.) was previously unmanaged grassland, but is now planted with Sitka spruce (density of *circa* 2500 stem ha^{-1}) (more details in Black *et al*., 2007). A previous publication lists 33 acarine species recorded from this site (Arroyo and Bolger, 2007). Here we report two new records of gamasid species which were found during a resampling of the site on 12 December 2006. Both species were collected from the organic soil layer.

The new records are of *Leptogamasus* (*Leptogamasus*) *obesus* (Holzmann, 1969) (1 adult female, 3 adult males) and *Leptogamasus* (*Valigamasus*)

pannonicus (Willmann, 1951) (2 adult females and 3 adult males). Both belong to the Parasitidae (Pergamasinae) and are new to the Irish fauna, not being reported in the checklist of Luxton (1998) or in the Ph.D. theses of Heneghan (1994) and O'Connell (1994). Voucher specimens are deposited in the School of Biology and Environmental Science, University College Dublin.

L. obesus is known from Central Europe (Karg, 1993). This author also suggests the same geographical distribution for *L. pannonicus* which was originally described from localities in Hungary and has since been found in other Central Europe locations such as in Eastern Austria (Čoja and Bruckner, 2006) and recently in Lithuania (Eitminaviciute, 2006). *L. obesus* has been collected in the Karkonosze National Park (Poland) (Gwiazdowic and Biernacik, 2000) and Romania (Stanescu, 2007).

L. obesus is described as preferring moderately wet substrates and is found in coprogenic humus, moss, lichens and decomposing litter, as well as between grass roots (Karg, 1993). It has occasionally been collected in deciduous and coniferous forests as were our individuals. *L. obesus* has been found in microhabitats such as moss, soil litter and dead organic matter in several coniferous forests in the Karkonosze National Park (Poland) (Gwiazdowic. and Biernacik, 2000).

The ecological preferences of *L. pannonicus* fit exactly the type of environment found in Dooary. The species is reported to have preferences for very wet niches, and is often found in flooding river bank forests, e.g. willows (Karg, 1993). In Austria, it was found in soil collected from spruce-fir-beech or acidophilus beech forests (Čoja and Bruckner, 2006). We found it in the wet gley soils located in Dooary.

These new records suggest that the above species may be widely distributed in the Palearctic region and that further studies will be needed to determine the extent of their distributions. They also suggest that the distributions of many Parasitidae may be underestimated.

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A SHORT HISTORY OF THE IRISH BIOGEOGRAPHICAL SOCIETY

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The Irish Biogeographical Society was founded in 1975 to encourage the study of Irish biodiversity with emphasis on the distributions of the plants and animals. However, the Society is also interested in the biogeographical implications of colonization and past history. From its inception, the Society has published an annual *Bulletin*. This year's issue is the thirty second in the series which now contains an impressive data-base including information on biota outside Ireland. *A catalogue and index of the publications of the Irish Biogeographical Society (1977-2004)* (Occasional Publication Number 8) demonstrates the great ranges of topics covered by the various papers. In 1986, a series of *Occasional Publications* was initiated. The tenth volume appeared in 2007. The *Occasional Publications* provide a useful means of publishing the proceedings of conferences or large articles on particular groups. In 2005, another series (*Macro Series*) was established. It is suitable for major checklists and bibliographies. Two titles, *First Supplement to A Bibliography of Irish Entomology* and *An Annotated Checklist of the Irish Butterflies and Moths (Lepidoptera)*, have now appeared.

The Society is voluntary and non-profit making. Funding consists of members' subscriptions and sponsorship. All the money is now used for the production, printing and distribution of its publications. However, in the past, the Society ran very successful field-meeting and workshops. Sadly, this aspect of its work had to be abandoned due to the high cost of insurance. For a short period, an attempt was made to offset this problem by establishing the Irish Biogeographical Society as a limited company. The success of the Society has been due to the high calibre of both its executive and ordinary members .

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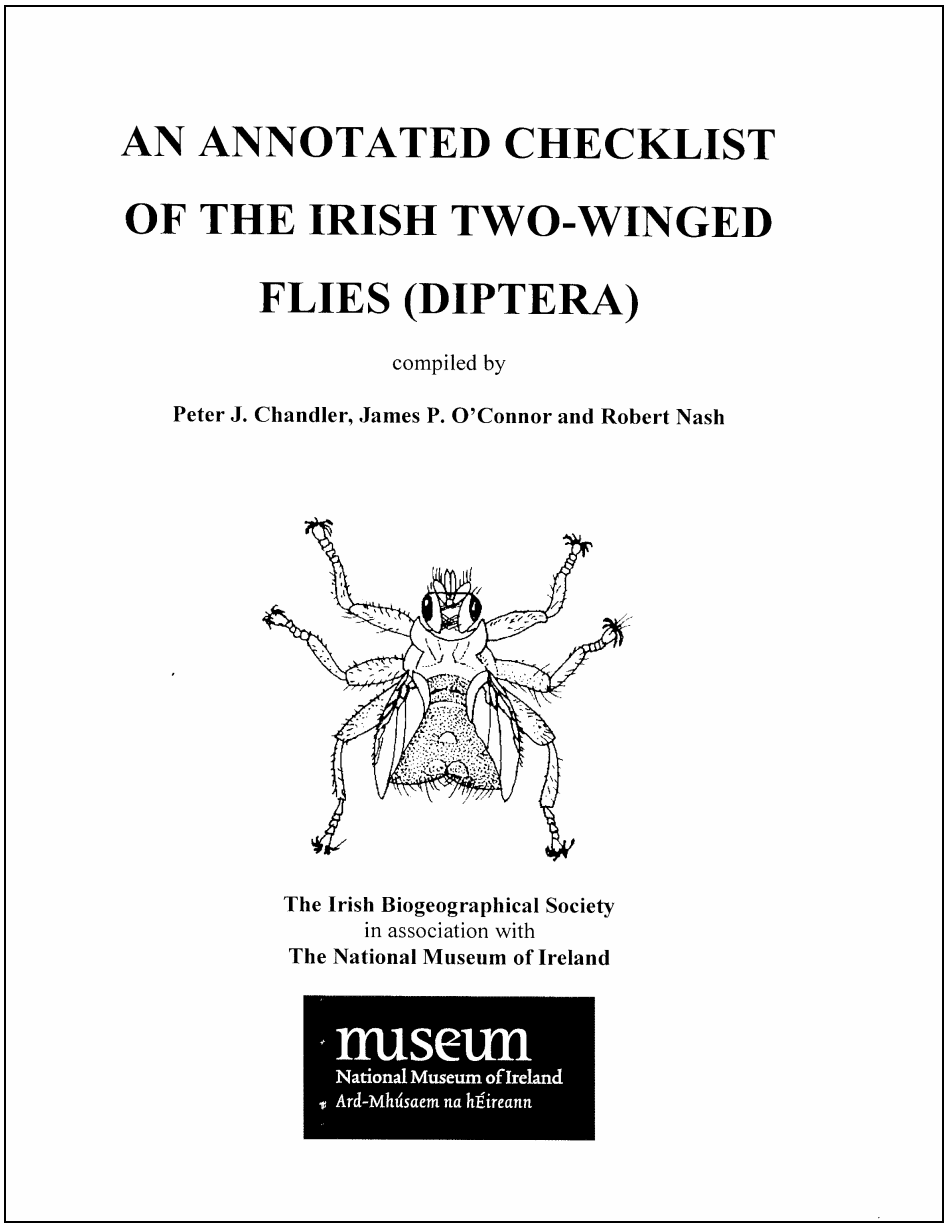

An annotated checklist of the Irish two-winged flies (Diptera) compiled by Peter J. Chandler, James P. O'Connor and Robert Nash. Published in 2008 by The Irish Biogeographical Society, Dublin in association with The National Museum of Ireland. ISBN 978-0-9550806-2-3. This book may be obtained from The Irish Biogeographical Society c/o Dr J. P. O'Connor, National Museum of Ireland, Kildare Street, Dublin 2, Ireland. Price €20 including packing and postage.

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