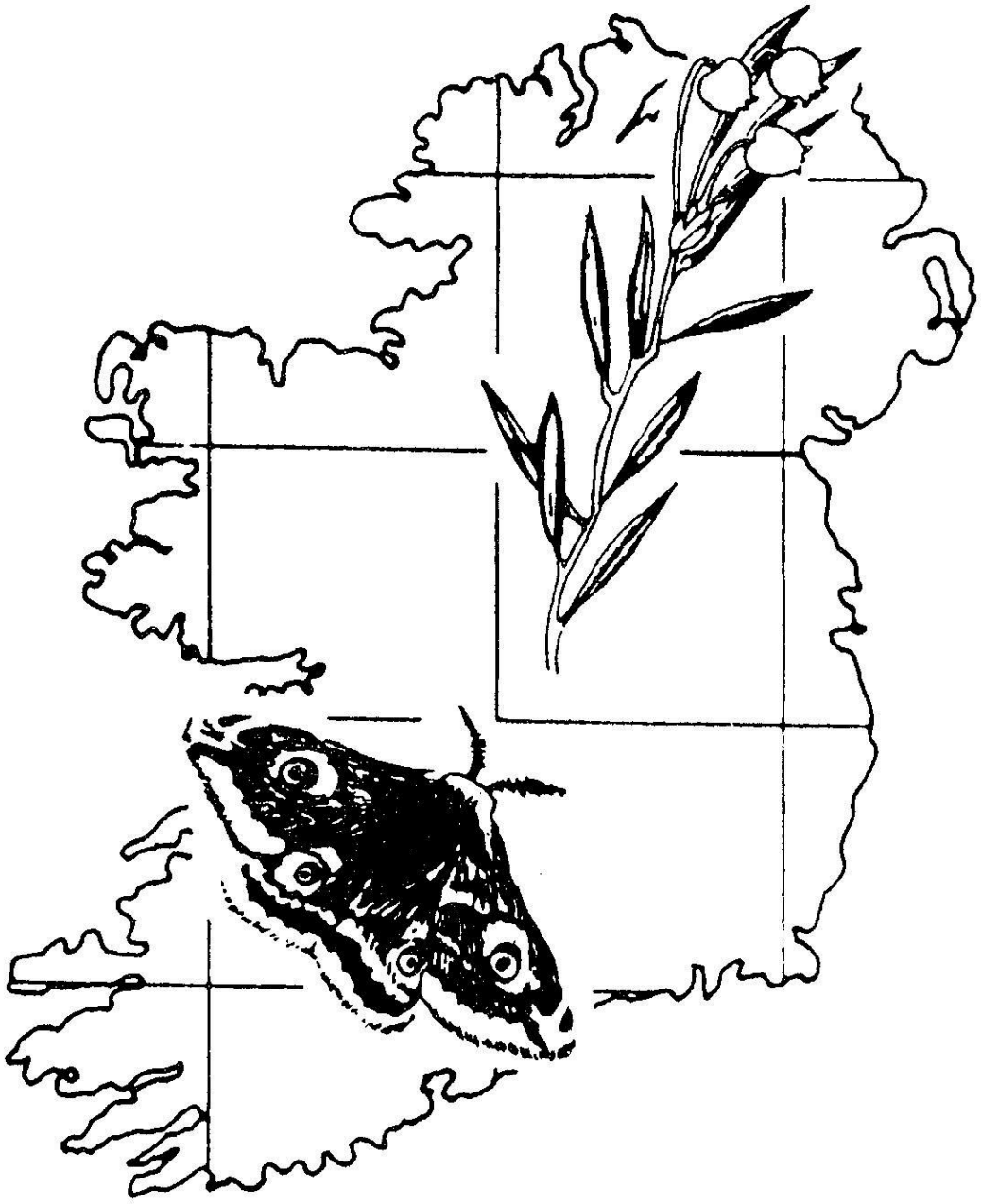
IRISH BIOGEOGRAPHICAL SOCIETY



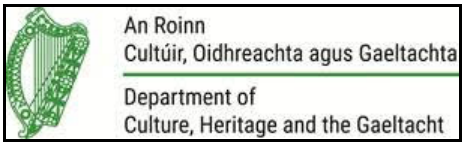
Bulletin No. 43

THE 2019 COMMITTEE
of
THE IRISH BIOGEOGRAPHICAL SOCIETY

Chairman: P. Ashe, B.Sc., Ph.D.
Treasurer: J. Walsh, B.A.
Editor: J. P. O'Connor, B.Sc., Ph.D., MRIA.
Executive Members: J. A. Good, B.A.(Mod.), Ph.D.; Professor T. M. Bolger, B.Sc., Ph.D.; R. Dolan, B.C.L.; J. M. C. Holmes, B.A.(Mod.); D. A. Murray, B.Sc., Ph.D.; W. A. Murray, B.Sc.

LIST OF SPONSORS

Professor Cormac Kilty and Anne Kilty
F. X. Downes
National Biodiversity Data Centre
The Department of Zoology, University College, Dublin
The Heritage Council
William Tracey and Sons
The National Parks and Wildlife Service of the Department of Culture, Heritage and the Gaeltacht



Bulletin of The Irish Biogeographical Society
Number 43

ISSN 0032-1185
Abbreviation: *Bull. Ir. biogeog. Soc.*

Editor: J. P. O'Connor

DATE OF PUBLICATION: 14 December 2019

The Irish Biogeographical Society desires it to be understood that it is not answerable for any opinion, representation of facts, or train of reasoning that may appear in the following papers. The authors of the various articles are alone responsible for their contents and for the correctness of references.

Data Protection Information

Members and Sponsors are hereby informed that non-sensitive personal data is held digitally by the committee solely for the purposes of recording subscriptions and the issuing of the society's publications and notices.

Enquiries concerning the Bulletin (including the purchase of back issues) may be sent by e-mail to the Editor Dr J. P. O'Connor <joconnor@museum.ie> or to the Treasurer Mr John Walsh at <ampersandwalsh@gmail.com>.

BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY
Number 43

CONTENTS

(*Contents continued overleaf*)

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

EDITORIAL

The Natural History Museum is scheduled to undergo major refurbishment in 2020-2024. This renovation work includes the replacement of the roof. As a result, all the building's contents will have to be removed and already the pinned insects with some other collections have been transferred to the National Museum of Ireland – Collections Resource Centre in Swords, County Dublin. Since its foundation, the back stock of the Irish Biogeographical Society, including the bulletins and books, have been stored in the Natural History Museum's library so the planned repairs could have had major implications for the Society. However Nigel Monaghan, Keeper of Natural History, has very kindly offered to transfer the Society's back issues from the Natural History Museum to storage in Beggar's Bush, Dublin City. The archive can be safely accommodated there with easy access to it. On behalf of the Society, I would like to thank Nigel for his very kind offer which has been accepted. I am very happy that this solution will also continue the close association between the Society and the Museum, one which has existed for over forty years.

Bulletin **Number 43** contains a very interesting mix of subjects. Although there are unconfirmed reports of juvenile Golden Redfish *Sebastes norvegicus* from Irish waters dating back to 1849, the occurrence of the species was not confirmed until 2005 and 2014 when the first two adult size specimens were captured off the north-west and west coasts respectively. Declan Quigley reports on this new addition to the Irish fauna.

Adam Mantell and Tim Clabon record the 'Garden Centre Spider' new to Ireland from the Johnstown Garden Centre, Naas, County Kildare. Declan Murray continues his interesting research on the Irish chironomids and his two papers include new chironomid (Diptera) records with an updated summary of species' distribution in Ireland. Research on the Irish caddisflies (Trichoptera) is also represented by papers on the fauna of County Antrim (editor and Cathal McNaughton) and Irish distributions (editor and Mary O'Connor). The latter contains records of some very rare species.

Declan Quigley and Dan Minchin present fascinating accounts of the discoveries of the Pecan Nut *Carya illinoinensis* and the Black Walnut *Juglans nigra* on Irish beaches. These finds should encourage members to search the Irish coastline for similar strandings. A generic name (with three included species) of a fossil chironomid has been an unavailable nomen nudum since its original description in 2009 because a type-species was not designated. In this issue, it is validated by Patrick Ashe and the editor.

Finally, winter-active staphylinid beetles are recorded from fields and field margins in Denmark and Ireland by Jervis Good. *Acidota cruentata* is recorded from County Cork. The species was previously only known from the Murlough Nature Reserve in County Down.

J. P. O'Connor, Editor, 17 October 2019

REVISED INSTRUCTIONS TO AUTHORS

1. Submitted manuscripts should follow the format of articles in *Bulletin* **Number 43** and other recent issues. The titles of journals should be given in full in the references. The references should be arranged alphabetically with, where relevant, Anon. appearing first.

2. Manuscripts may be submitted by e-mail to the Editor at <joconnor@museum.ie> or *via* our Treasurer Mr John Walsh at <ampersandwalsh@gmail.com>. Figures and photographs should be sent as jpegs. Complex tables should also be sent as jpegs and not in Excel. Remember that all figures and tables should be submitted in a type size which will remain legible after reduction to A5. Typed copy is still acceptable. It should be sent, on A4 paper, using double-spacing and 2.5cm (one inch) margins with the text and any figures on an accompanying compact disc or USB stick, to the Editor, Dr J. P. O'Connor, Emeritus Entomologist, National Museum of Ireland – Natural History, Merrion Street, Dublin D02 F627, Ireland.

3. Word is preferred and Times New Roman 13pt should be used.

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 the 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 the collector's name), and
(e) altitude data should be included where relevant.

5. Each year, the closing date for submissions will be the 15 October for that year's *Bulletin*. Mss received after that date will be considered for the following year's *Bulletin*. All papers will be refereed and any major changes referred to the author(s) for consideration.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

FIRST RECORDS OF THE GOLDEN REDFISH *SEBASTES NORVEGICUS* (ASCANIUS, 1772) [*S. MARINUS* (NON LINNAEUS, 1758)] (SCORPAENIFORMES: SEBASTIDAE: SEBASTINAE) FROM IRISH WATERS

Declan T. G. Quigley
Sea Fisheries Protection Authority, Auction Hall, West Pier, Howth, Co. Dublin, Ireland.
e-mail: <declan.quigley@sfpa.ie>

Abstract

Although there are unconfirmed reports of juvenile Golden Redfish *Sebastes norvegicus* (Ascanius, 1772) from Irish waters dating back to 1849, the occurrence of the species was not confirmed until 2005 and 2014 when the first two adult size specimens were captured off the north-west and west coasts respectively. The status of all known species of Sebastinae in Irish waters is reviewed.

Key words: Golden Redfish, *Sebastes norvegicus*, *Sebastes*, Irish waters.

Introduction

Redfishes, Scorpionfishes and Rockfishes belong to a large family (Sebastidae) of fishes within the order Scorpaeniformes. The sub-family Sebastinae is represented by seven genera and about 133 species worldwide, the vast majority occurring in the North Pacific (Nelson, 2006). In the NE Atlantic, the Sebastinae is represented by three genera and five indigenous species (Quigley, 2011a, b): Blue-mouth Rockfish *Helicolenus dactylopterus* (Delaroche, 1809), Golden Redfish *Sebastes norvegicus* (Ascanius, 1772), Deepwater Redfish *S. mentella* Travin, 1951, Norway Haddock *S. viviparus* Krøyer, 1845, and Spiny Scorpionfish *Trachyscorpia echinata* (Köhler, 1896). The Arcadian Rockfish *S. fasciatus* Storer, 1854, which is common in the NW Atlantic (Scott and Scott, 1988; Klein-MacPhee and Collette, 2002), has occasionally been captured in western Icelandic waters (Garabana Barro, 2005). Two non-indigenous NW Pacific species, the Korean Rockfish *S. schlegelii* Hilgendorf, 1880, and the False Kelpfish *Sebastiscus marmoratus* (Cuvier, 1829) have been recorded from Dutch (Kai and Soes, 2009) and U.K. waters (Norman 1935; Wheeler and Eschmeyer, 1968) respectively.

There is a long history of taxonomic confusion and frequent misidentifications amongst *Sebastes* species (Eschmeyer, 1969; Power and Ni, 1985; Trottier *et al*., 1988; Kendall, 2000; Joensen and Grahl-Nielsen, 2000; Johansen and Dahle, 2004; Garabana Barro, 2005; Hyde and Vetter, 2007; Bunke *et al*., 2012), primarily due to significant overlaps in external morphometric and meristic characters, the occurrence of phenotypic eco-morphs (Johansen *et al*., 2000), introgressive hybridization (Roques *et al*., 2001), and in some cases, the indiscriminate use of synonyms and shared common names. Furthermore, due to low genetic

diversity, molecular methods have generally failed to satisfactorily discriminate between North Atlantic species (Mecklenburg *et al.*, 2018). Although the internal attachment pattern of the gas-bladder musculature to the vertebral column is generally considered to be a reliable discriminatory character, the temporal stability and suitability of this character is not applicable in all areas of *Sebastes* distribution within the North Atlantic (Garabana Barro, 2005).

Although *H. decadactylus* (Plate 1), *S. mentella* (Plate 2), *S. viviparus* (Plate 3), and *T. echinata* (Plate 4) have all been recorded from Irish waters (Holt and Calderwood, 1895; Holt and Byrne, 1908; O'Riordan, 1965; Wheeler and Blacker, 1972; Went and Kennedy, 1976; Holmes, 1994; Connolly and Kelly, 1994a, b; Kelly *et al*., 1997; Briggs, 1998; Nolan, 2004a, b; Iglésias, 2014; Heessen and Blasdale, 2015), the occurrence of *S. norvegicus* has remained ambiguous.

***Sebastes norvegicus* (Ascanius, 1772) [*S. marinus* (non Linnaeus, 1758)]**

Fernholm and Wheeler (1983) noted that the type specimen of *Sebastes marinus* was erroneously described by Linnaeus in 1758 as *Perca marina* based on a specimen of the Painted Comber *Serranus scriba* (L.) obtained from the Mediterranean Sea and that an alternative scientific name was required. They noted that although Ascanius had first described the Golden Redfish from Norwegian waters as *Perca norvegica* in 1772, the species should be reassigned to the genus *Sebastes,* which led to the adoption of the official scientific name *S. norvegicus* by the International Commission on Zoological Nomenclature. Nevertheless, the incorrect synonym *S. marinus* remains in common use.

S. norvegicus is a bentho-pelagic (100-1000m) species which is found on both sides of the North Atlantic. The species is ovoviviparous, giving birth to live pelagic larvae, slow-growing, long-lived (*circa* 60 years), attains a maximum size of 100cm TL (total length) and 15kg, and is commercially important in northern latitudes (Wheeler, 1969, 1978; Hureau and Litvinenko, 1986; Scott and Scott, 1988; Klein-MacPhee and Collette, 2002; Garabana Barro, 2005; Wienerroither *et al*., 2013; Heessen and Blasdale, 2015; Mecklenburg *et al*., 2018). In the NW Atlantic, *S. norvegicus* extends from New Jersey (rarely) northwards via SE Labrador (Canada) to Greenland (Scott and Scott, 1988; Klein-MacPhee and Collette, 2002). In the NE Atlantic, the species generally extends from northern parts of the North Sea and Kattegat to Spitsbergen, eastwards to Novaya Zemlya, and westwards to Iceland (Hureau and Litvinenko, 1986). The species has occasionally been reported (as *S. marinus*) from the Faeroe-Shetland Channel (Boyd and Lordan, 1998), W of Shetland (Nolan, 2004b), Rockall Trough (Clarke *et al*., 1997), southern North Sea (Hoek, 1896; Redeke, 1941; Poll, 1947; Wheeler and Blacker, 1969; Wheeler *et al*., 1975), Isle of Man - Irish Sea (Bruce *et al*., 1963), and NW France (Du Buit and Quero, 1989; Quero *et al*., 2003; Heessen and Blasdale, 2015).

Sebastes norvegicus in Irish waters

During March 1849, two specimens of *Sebastes norvegicus* were reported to have been taken on long lines set for Ling *Molva molva* (L.) in deep waters off the Wild Bank, Dingle Bay, County Kerry. Several more specimens were subsequently reported from the same area. During the summer of 1850, two specimens were taken on long lines set for Cod *Gadus morhua* L. at a depth of 162m off the Foze Rocks, SW Blasket Islands, County Kerry (Andrews, 1860a, b, c; Andrews, 1870). Four of Andrews' specimens, which are in the collections of the National Museum of Ireland – Natural History (NMINH) (O'Riordan, 1965; Holmes, 1994), were re-examined by Scharff (1891) who discovered that they were all *H. dactylopterus* (as *Sebastes dactyloptera*), and concluded that *S. norvegicus* had never been obtained from Irish waters. Indeed, the specimen figured by Andrews (1860c) is clearly *H. dactylopterus* (Plate 5). A number of authors subsequently remarked that Irish specimens of *H. dactylopterus* (as *Scorpaena dactyloptera*) had been repeatedly confused with *S. norvegicus* (Holt and Calderwood, 1895; Holt and Byrne, 1908; Went 1953). *Helicolenus dactylopterus* is now known to be quite common off Dingle Bay (Quigley, 2011a).

During the 1960s and 1970s, seven juvenile specimens (100-185mm TL; 4.8-50.0g) of *S. marinus* were reported from relatively shallow inshore waters (depths <100m) in Dingle Bay (Went, 1969, 1972; Minchin and Molloy, 1976, 1978, 1980). The specimens were poorly described and only one was preserved (NMINH: 1968.45.1; Went, 1969). The latter specimen (Plate 6), measuring 130mm TL, was re-examined by the author and confirmed as *S. viviparus* based on the backward orientation of the pre-opercular spines and the estimated number of oblique scale rows (<55) below the lateral line. The following fin ray counts were recorded: dorsal XV+14; anal III+7; and pectoral 18. Although there was a prominent symphyseal knob on the lower jaw, this was considered to be an artefact following 50 years preservation in industrial methylated spirits (Wienerroither and Nedreaas, pers. comm.). While it cannot be confirmed, it is possible that the other six unpreserved juveniles reported from Dingle Bay may also have been *S. viviparus*. There is only one previously confirmed record of *S. viviparus* from Irish waters; an unpreserved specimen weighing 340g was captured by an angler near the mouth of Larne Lough at the Maidens, County Antrim, NE Ireland (Briggs, 1998).

During the early 1990s, three adult size specimens of *Sebastes* (Plates 7-8), which were captured at a depth of *circa* 200m W of Slyne Head, County Galway (*circa* 53.0°N, 11.5°W) during November 1992 and October 1993, were registered as *S. norvegicus* in the NMINH collections (NMINH: 1992.61.1; 1992.61.2; 1993.67.1). These specimens, measuring 405, 385 and 540mm TL, weighing 850, 750 and 2125g respectively, were re-examined by the author, and all were confirmed as *S. mentella* based on the presence of a prominent sympheal knob on the lower jaw, and the obliquely forward direction of the lower pre-opercular spine. Each of the specimens had the following fin ray counts: dorsal XV+16; anal III+9; and pectoral 19.

During early April 2005, a heavily pregnant female specimen of *S. norvegicus* (Plate 9), measuring 680mm TL and weighing 6.83kg, was captured by the MFV 'Roselend' (CC 911294) [Skipper: Armand Breton, Trégunc, France] while demersal trawling at depths of 240-880 m along the edge of the continental slope off NW Ireland (ICES Division VIa, 41-44E0; 56-58°N, 09-10°W). The specimen was identified as *S. norvegicus* based on the keys provided by Hureau and Litvinenko (1986). The symphyseal knob on the lower jaw was poorly developed, and the lower pre-opercular spine was pointing downwards and slightly backwards. The following fin ray counts were recorded: dorsal XV+15; anal III+8; and pectoral 19. The specimen represents the first authenticated record of *S. norvegicus* from Irish waters. It is interesting to note that during the course of the eight-day fishing trip (3-10 April 2005), the vessel logged 90kg of unspecified *Sebastes* sp., representing only 0.4% of the total weight (20713kg) of fish landed into Killybegs, County Donegal on 11 April 2005.

During mid-July 2014, the MFV 'Ocean Harvester II' (G688) [Skipper: Tomas Conneely, Rahoon, County Galway] captured a specimen of *S. norvegicus* (Plate 10), measuring 690mm TL, 670mm FL (fork length) and weighing 5.88kg (5.65kg gutted), while demersal trawling for *Nephrops* prawns at a depth of *circa* 100m west of the Aran Islands, County Galway, off the west coast of Ireland (ICES Division VIIb, 35D9; *circa* 53.25°N, 10.5°W). The symphyseal knob on the lower jaw was absent, and the lower pre-opercular spine was pointing downwards and slightly backwards. The following fin ray counts were recorded: dorsal XV+15; anal III+8; and pectoral 19. The identity of the specimen and its estimated age (40 +/- 1 years, based on otolith analysis) was confirmed by Kjell Nedreaas and Arne Storaker (pers. comm.) at the Institute of Marine Research, Bergen, Norway. The specimen represents the second authenticated record of *S. norvegicus* from Irish waters.

Discussion

It is possible that *Sebastes norvegicus* may occur more frequently in Irish waters, particularly in deep offshore waters (depths >200m), than the current paucity of records would suggest. Indeed, the occurrence of *S. norvegicus* in Irish waters is not surprising considering that the species has also been recorded, albeit rarely, from continental shelf waters (420m) off NW France (ICES Division VIIIa). Indeed, it is interesting to note that specimens of *S. viviparus* have also been reported from the same area, including the Porcupine Bank and off NW Ireland (Heessen and Blasdale, 2015), and during October 2009, a mature male specimen of *S. mentella* (445mm TL) was captured in a demersal trawl at a depth of 684m off the Galician coast (44° 06'N, 08° 56'W), NW Spain (Fernandez-Zapico *et al*., 2012).

Considering the long history of taxonomic confusion and frequent misidentifications amongst *Sebastes* species, it is recommended that all specimens should be preserved for detailed examination. Indeed, historical and unverified records on public databases (e.g. GBIF),

particularly from the southern limits of their known distribution, should be interpreted with caution (Maldonado *et al*., 2015), particularly inshore (<40m) observational records of *S. norvegicus* reported by SCUBA-divers which could be confused with either *H. dactylopterus* or *S. viviparus*.

Acknowledgements

I am grateful to the skippers mentioned in the text, and to the following for their generous assistance: Stephane Griesbach (Gannet Fishmongers, Royal Rock Industrial Estate, Ballybane, Galway), Siubhan Curran (Sea Fisheries Protection Authority, Rossaveal, County Galway), Kjell Nedreaas, Rupert Wienerroither, Arne Storaker and Benjamin Planque (Institute of Marine Research, Bergen, Norway), Torlid Johansen and Jonathan Ready (University of Bergen, Norway), Maurice Clarke, Norman Graham, Graham Johnston and Ciaran Kelly (Marine Institute, Oranmore, Galway), Nigel Monaghan and Paolo Viscardi (National Museum of Ireland - Natural History, Dublin), Stuart McWilliams and Declan MacGabhann (SFPA, Howth, County Dublin), Dominick Verschelde (Ghent University Museum, Belgium), Dan Minchin (Marine Organism Investigations, Ballina, Killaloe, County Clare), Robert Rosell and Richard Briggs (Agri-Food and Biosciences Institute, Belfast), Rafa Banon Diaz (Dirección Xeral de Ordenación e Xestión dos Recursos Mariños, Consellería do Mar, Santiago de Compostela, Spain), Alejandro Escánez Pérez and Alberto Brito (Universidad de la Laguna, Tenerife, Spain), and Jonas Ekström (Biologiska Museet, Lund, Sweden).

References

Andrews, W. (1860a) On the species of *Cottus* on the south west coast. *Proceedings of the Natural History Society of Dublin* **1** (1849-1855): 119-122.

Andrews, W. (1860b) On varieties of the Pleuronectidae. *Proceedings of the Natural History Society of Dublin* **1** (1849-1855): 134-135.

Andrews, W. (1860c) Record of the occurrence of the Bergylt and Greenland Bullhead on the Irish coast. *Proceedings of the Natural History Society of Dublin* **2** (1856-1859): 61-62.

Andrews, W. (1870) On the ichthyology of the south-west coast of Ireland, and a collection of zoological specimens obtained for the Society during the summer and autumn of 1868. *Journal of the Royal Dublin Society* **5**: 379-389.

Boyd, J. and Lordan, C. (1998) Deep-water exploratory trawl survey on the Faeroe-Shetland Channel. Demersal Survey Report 3. Marine Institute, Dublin 15. 13 pp.

Briggs, R. (1998) Norway Haddock *Sebastes viviparus* Krøyer, 1844, off Northern Ireland. *Irish Naturalists' Journal* **26**: 52-53.

Bruce, J. R., Colman, J. S. and Jones, N. S. (1963) *Marine fauna of the Isle of Man*. Memoir No. 36. Liverpool University Press, Liverpool. 307 pp.

Bunke, C., Hanel, R. and Trautner, J. H. (2012) Phylogenetic relationships among North Atlantic redfish (genus *Sebastes*) as revealed by mitochondrial DNA sequence analysis. *Journal of Applied Ichthyology* **29**: 82-92.

Clarke, M., Fitzpatrick, M. and Lordan, C. (1997) Deep-water trawl survey on the eastern slopes of the Rockall Trough. *Demersal Survey Report* **7**. Marine Institute, Dublin 15. 12 pp.

Connolly, P. L. and Kelly, C. J. (1994a) Report on the 1993 Sampling Surveys Programme for Deep Water Demersal Fish off the west coast of Ireland and Scotland. EC STRIDE Project SA2. *Fishery Leaflet* **160**. 123 pp.

Connolly, P. L. and Kelly, C. J. (1994b) Sampling surveys for deep-water demersal fish in 1993. *Fishery Leaflet* **163**. 21 pp.

Du Buit, M.-H. and Quero, J.-C. (1989) Extension de l'aire de répartition connue de trois espèces de Téléostéens de l'Atlantique nord-est. *Cybium* **13**: 388.

Eschmeyer, W. N. (1969) A systematic review of the Scorpionfishes of the Atlantic Ocean (Pisces: Scorpaenidae). *Occasional Papers of the California Academy of Sciences* **79**. 130 pp.

Fernandez-Zapico, O., Arronte, J. C. and Ruiz-Pico, S. (2012) Occurrence of *Sebastes mentella* (Scorpaeniformes: Sebastidae) off the Galician coast (NW Spain) (North-eastern Atlantic). *Cybium* **36**: 591-592.

Fernholm, B. and Wheeler, A. (1983) Linnaean fish specimens in the Swedish Museum of Natural History, Stockholm. *Zoological Journal of the Linnaean Society* **78**: 199-286.

Garabana Barro, D. (2005) The genus *Sebastes* Cuvier, 1829 (Pisces: Scorpaenidae) in the North Atlantic: species and stock discrimination using traditional and geometric morphometrics. Unpublished Ph.D. Thesis. Instituto de Investigaciones Marinas (CSIC), Universidade de Vigo, Spain. 306 pp.

Heessen, H. and Blasdale, T. (2015) Order Scorpaeniformes. Pp 279-287. *In* Heessen, H. J. L., Daan, N. and Ellis, J. R. (eds) *Fish atlas of the Celtic Sea, North Sea, and Baltic Sea*. KNNV Publishing, The Netherlands.

Hoek, P. P. C. (1896) Mededeeling over de vangst van *Sebastes norvegicus* bij de Noorder Haaks. *Nederlandsch Tijdschrift voor de Dierkunde* **5**: 1.

Holmes, J. M. C. (1994) *Catalogue and list of the reserve collection of fish. National Museum of Ireland - Natural History*. Unpublished manuscript.

Holt, E. W. L. and Byrne, L. W. (1908) Second report on the fishes of the Irish Atlantic Slope. *Fisheries, Ireland, Scientific Investigations 1906* **5** (1908). Department of Agriculture and Technical Instruction for Ireland. 63 pp.

Holt, E. W. L. and Calderwood, W. L. (1895) Survey of fishing-grounds, west coast of Ireland, 1890-1891. Report on the rarer fishes. *Scientific Transactions of the Royal Dublin Society*

V (Series II): 361-525.

Hureau, J.-C. and Litvinenko, N. I. (1986) Scorpaenidae. Pp 1211-1229. *In* Whitehead, P. J. P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J. and Tortonese, E. (eds) *Fishes of the North-eastern Atlantic and the Mediterranean* **3**. UNESCO, Paris.

Hyde, J. R. and Vetter, R. D. (2007) The origin, evolution, and diversification of rockfishes of the genus *Sebastes* (Cuvier). *Molecular Phylogenetics and Evolution* **44**: 790-811.

Iglésias, S. P. (2014) Handbook of the marine fishes of Europe and adjacent waters (A natural classification based on collection specimens, with DNA barcodes and standardized photographs), Volume II (Actinopterygians), Provisional version 10, 01 March 2014. 246 pp. <http://iccanam.mnhn.fr.>

Joensen, H. and Grahl-Nielsen, O. (2000) Discrimination of *Sebastes viviparous, Sebastes marinus* and *Sebastes mentella* from Faroe Islands by chemometry of the fatty acid profile in heart and gill tissues and in the skull oil. *Comparative Biochemistry and Physiology – Part B: Biochemical & Molecular Biology* **126**: 69-79.

Johansen, T. and Dahle, G. (2004) Discrimination among species of the genus *Sebastes* in the North Atlantic by random amplified polymorphic DNA. *Sarsia* **89**: 478-483.

Johansen, T., Naevdal, G., Danielsdottir, A. K. and Hareide, N. R. (2000) Genetic characterization of giant *Sebastes* in the deep water slopes in the Irminger Sea. *Fisheries Research* **45**: 207-216.

Kai, Y. and Soes, M. D. (2009) A record of *Sebastes schlegelii* Hilgendorf, 1880 from Dutch coastal waters. *Aquatic Invasions* **4**: 417-419.

Kelly, C. J., Clarke, M. and Connolly, P. L. (1997) Catch and discards from a deep-water trawl survey in 1996. *Fishery Leaflet* **175**. 16 pp.

Kendall, A. W. (2000) An historical review of *Sebastes* taxonomy and systematics. *Marine Fisheries Review* **62**: 1-23.

Klein-MacPhee, G. and Collette, B. B. (2002) Scorpionfishes: Family Scorpaenidae. Pp 331-338. *In* Collette, B. B. and MacPhee, G. (eds) *Bigelow and Schroeder's fishes of the Gulf of Maine*. 3rd Edition. Smithsonian Institution Press, Washington and London.

Maldonado, C., Molina, C. I., Zizka, A., Persson, C., Taylor, C. M., Alban, J., Chilquillo, E., Ronsted, N. and Antonelli, A. (2015) Estimating species diversity and distribution in the era of Big Data: to what extent can we trust public databases? *Global Ecology and Biogeography* **24**: 973-984.

Mecklenburg, C. W., Lynghammar, A., Johannesen, E., Byrkjedal, I., Christiansen, J. S., Dolgov, A. V., Karamushko, O. V., Mecklenburg, T. A., Møller, P. R., Steinke, D. and Wienerroither, R. M. (2018) *Marine Fishes of the Arctic Region*. **1**. CAFF Monitoring Series Report 28. Conservation of Arctic Flora and Fauna, Akureyri, Iceland. 454 pp.

Minchin, D. and Molloy, J. (1976) Notes on fishes taken in Irish waters. *Irish Naturalists' Journal* **18**: 360-363.

Minchin, D. and Molloy, J. (1978) Notes on fishes taken in Irish waters in 1976. *Irish Naturalists' Journal* **19**: 160-162.

Minchin, D. and Molloy, J. (1980) Notes on some fishes taken in Irish waters during 1978. *Irish Naturalists' Journal* **20**: 93-97.

Nelson, J. S. (2006) *Fishes of the World*. 4th Edition. John Wiley & Sons, Inc., Hoboken, New Jersey, U.S.A. 601 pp.

Nolan, C. P. (2004a) A technical and scientific record of experimental fishing for deepwater species in the Northeast Atlantic, by Irish fishing vessels, in 2001. 1 - Report. *BIM Fisheries Resource Series* **1**(1). 172 pp.

Nolan, C. P. (2004b) A technical and scientific record of experimental fishing for deepwater species in the Northeast Atlantic, by Irish fishing vessels, in 2001. 2 - Appendices. *BIM Fisheries Resource Series* **1** (2). 309 pp.

Norman, J. R. (1935) Notes on the fishes of the family Scorpaenidae recorded from the British coasts, with a description of a new species. *Proceedings of the Zoological Society of London* **3**: 611-614.

O'Riordan, C. E. (1965) *A catalogue of the collection of Irish fishes in the National Museum of Ireland*. Stationery Office, Dublin. 96 pp.

Poll, M. (1947) *Faune de Belgique. Poissons Marins*. Patrimoine du Musee royal d'Histoire Naturelle de Belgique, Bruxelles. 452 pp.

Power, D. J. and Ni, I.-H. (1985) Morphometric differences between Golden Redfish (*Sebastes marinus*) and Beaked Redfishes (*S. mentella* and *S. fasciatus*). *Journal of Northwest Atlantic Fisheries Science* **6**: 1-7.

Quero, J.-C., Porche, P. and Vayne, J.-J. (2003) *Guide des poissons de l'Atlantique europeen*. Delachaux et Niestle, Lonay (Switzerland) & Paris. 465 pp.

Quigley, D. T. G. (2011a) Bluemouth in Irish Waters. *Irish Angler's Digest* **13**: 25-26.

Quigley, D. T. G. (2011b) Redfishes & Rockfishes in Irish & European Atlantic Waters. *Sherkin Comment* **51**: 19.

Redeke, H. C. (1941) *De Visschen van Nederland*. A. W. Sijthoff's Uitgeversmij N.V., Leiden. 331 pp.

Roques, S., Sevigny, J.-M. and Bernatchez, L. (2001) Evidence for broadscale introgressive hybridization between two redfish (genus *Sebastes*) in the North-west Atlantic: a rare marine example. *Molecular Ecology* **10**: 149-165.

Scharff, R. F. (1891) Report on the fishes obtained off the south-west coast of Ireland during the cruises of the "Lord Bandon" and the "Flying Falcon", 1886 and 1888. *Proceedings of*

the Royal Irish Academy (3rd Series) **1**: 456-459.

Scott, W. B. and Scott, M. G. (1988) Atlantic Fishes of Canada. *Canadian Bulletin of Fisheries and Aquatic Sciences* **219**: 479-487. University of Toronto, Canada.

Trottier, B. L., Rubec, P. J. and Ricard, A. C. (1988) Biochemical separation of Atlantic Canadian redfish: *Sebastes mentella* and *Sebastes norvegicus*. *Canadian Journal of Zoology* **67**: 1332-1335.

Went, A. E. J. (1953) Specimen of *Scorpaena dactyloptera* Delaroche from Dingle Bay. *Irish Naturalists' Journal* **11**: 107.

Went, A. E. J. (1969) Rare fishes taken in Irish waters in 1968. *Irish Naturalists' Journal* **16**: 147-150.

Went, A. E. J. (1972) Interesting fishes taken in Irish waters in 1971. *Irish Naturalists' Journal* **17**: 201-215.

Went, A. E. J. and Kennedy, M. (1976) *List of Irish fishes* (3rd Edition). Stationery Office, Dublin. 47 pp.

Wheeler, A. (1969) *The fishes of the British Isles and North-West Europe*. Michigan State University Press, U.S.A. 613 pp.

Wheeler, A. (1978) *Key to the fishes of Northern Europe*. Frederick Warne, London. 380 pp.

Wheeler, A. and Blacker, R. W. (1969) Rare and little-known fishes in British seas in 1966 and 1967. *Journal of Fish Biology* **1**: 311-331.

Wheeler, A. and Blacker, R. W. (1972) Rare and little-known fishes in British seas in 1968 and 1969. *Journal of Fish Biology* **4**: 141-170.

Wheeler, A., Blacker, R. W. and Pirie, S. F. (1975) Rare and little-known fishes in British seas in 1970 and 1971. *Journal of Fish Biology* **7**: 183-201.

Wheeler, A. and Eschmeyer, W. N. (1968) The identity of the 'British' scorpionfish *Helicolenus microphthalmus*. *Journal of the Linnaean Society (Zoology)* **47**: 309-314.

Wienerroither, R., Johannesen, R., Dolgov, A., Byrkjedal, I., Aglen, A., Bjelland, O., Drevetnyak, K., Eriksen, K. B., Høines, Å., Langhelle, G., Langøy, H., Murashko, P., Prokhorova, T., Prozorkevich, D., Smirnov, O. and Wenneck, T. (2013) *Atlas of the Barents Sea fishes based on the winter survey*. IMR-PINRO Joint Report Series 2-2013. 220 pp.

PLATE 1. Blue-mouth Rockfish *Helicolenus dactylopterus* from Dingle Bay, County Kerry, 30 January 2011. Photograph © Declan MacGabhann.

PLATE 2. Deepwater Redfish *Sebastes mentella*, Norway, 8 February 2006 (NMINH 2007.28.1 & 29.1). Photograph © Declan Quigley.

PLATE 3. Norway Haddock *Sebastes viviparus*, Norway, 10 November 2004. Photograph © Jonathan Ready.

PLATE 4. Spiny Scorpionfish *Trachyscorpia echinata*, Galician Bank, North West Spain. Photograph © Rafa Banon Diaz.

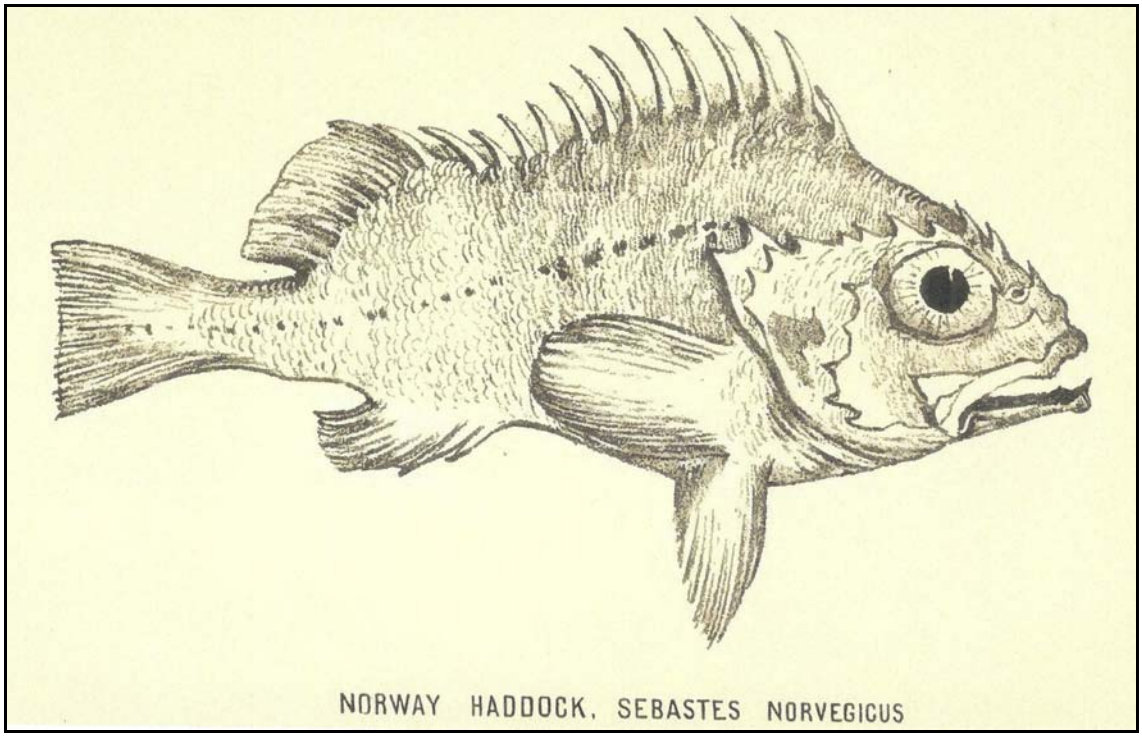


PLATE 5. Blue-mouth *Helicolenus dactylopterus* (*Sebastes norvegicus* sic) Andrews (1860c).

PLATE 6. Norway Haddock *Sebastes viviparus*, Dingle Bay, County Kerry (NMINH 1968.45.1; Went, 1969). Photograph Declan © Quigley.

PLATE 7. Deepwater Redfish *Sebastes mentella*, West of Slyne Head, County Galway (NMINH 1992.61.1 & 2). Photograph © Declan Quigley.

PLATE 8. Deepwater Redfish *Sebastes mentella*, West of Slyne Head, County Galway (NMINH 1993.67.1). Photograph © Declan Quigley.

PLATE 9. Golden Redfish *Sebastes norvegicus*, North West Ireland, April 2005. Photograph © Declan Quigley.

PLATE 10. Golden Redfish *Sebastes norvegicus*, West of the Aran Islands, County Galway, July 2015. Photograph © Stephane Griesbach.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

THE 'GARDEN CENTRE SPIDER' *ULOBORUS PLUMIPES* (LUCAS, 1846) (ARANEAE: ULOBORIDAE) NEW TO IRELAND

Adam Mantell[1] and Tim Clabon[2]
[1]*42 Kernaghan Park, Annahilt, Hillsborough, Co. Down BT26 6DF, Northern Ireland.*
e-mail: <amantell20@gmail.com>
[2]*9 Ard Mor Drive, Fortunestown, Tallaght, Dublin 24, Republic of Ireland.*
e-mail: <tclabon@yahoo.co.uk>

Abstract

A number of specimens of the 'Garden Centre Spider' *Uloborus plumipes* (Lucas, 1846) (Araneae: Uloboridae) including egg sacs and juvenile spiders were observed at Johnstown Garden Centre, Naas, County Kildare (IGR N919218). A female specimen was subsequently taken on 17 September 2017 and confirmed as *U. plumipes.* This species is new to Ireland. It is also the first Irish record of the genus *Uloborus Latreille*, 1806.

Key words: Araneae, Uloboridae, *Uloborus plumipes*, 'Garden Centre Spider' Ireland, new.

Introduction

Uloborus plumipes (Lucas, 1846) is known colloquially as the 'Garden Centre Spider' for good reason. In Britain, it is a relatively frequent import with garden plants from the continent and has been widely reported in garden centres from the central belt of Scotland to the south coast of England (British Arachnological Society, 2018). It is therefore perhaps surprising that this is the first record of this species and genus in Ireland. The spider requires a frost-free environment and can be abundant in the places that it is found (often but not exclusively greenhouses) and where it may play a role in pest control (British Arachnological Society, 2018).

Material

KILDARE: Johnstown Garden Centre, Naas (N919218), 1♀ 17 September 2017, collected by Tim Clabon, identified by Adam Mantell. Deposited in the National Museum of Ireland – Natural History, Dublin. Egg sacs and juvenile spiders were also observed on the same date.

Identification and appearance

Uloborus plumipes is quite distinctive. At rest, it resembles a piece of dried vegetation with legs 1 and 2 pointing forward. The abdomen is wider anteriorly with two dorsal tubercles, and tapers to a narrow point posteriorly. Colour is variable, grey, pale brown to black. Perhaps the most distinctive feature however is that tibia 1 of the female has a dense covering of long fine

hairs. The web is a small (up to 30cm) horizontal sheet web.

Identification was confirmed using diagrams available online (Nentwig *et al*., 2018; Oger, 2018).

Distribution

At a micro-habitat level, specimens were found on plants under cover outdoors, on indoor plant displays and amongst the dog food section at Johnstown Garden Centre. It is worth noting that TC observed both egg sacs and juvenile spiders indicating that the spider is breeding successfully at that site. Given the requirement for frost-free surroundings, it seems unlikely that the distribution of this species will expand away from synanthropic settings. Further searching of areas protected from frost within garden centres across Ireland seems likely to yield additional records of this species.

Acknowledgement

Thanks are due to Myles Nolan for arranging for the specimen to be lodged in the National Museum of Ireland – Natural History, Dublin.

References

British Arachnological Society (2018) Spider and Harvestman Recording Scheme web site - the national recording schemes for spiders and harvestmen in Britain. <http://srs.britishspiders.org.uk/ portal.php/p/Summary/s/ Uloborus+plumipes> (accessed 17 May 2018).

Nentwig, W., Blick, T., Gloor, D., Hänggi, A. and Kropf, C. (2018) Araneae. Spiders of Europe. *Uloborus plumipes* Lucas, 1846 <https://araneae.nmbe. ch/data/1072> (accessed 17 May 2018).

Oger, P. (2018) Les araignées de Belgique et de France. *Uloborus plumipes*. <https://arachno.piwigo.com/index?/category/578-uloborus_plumipes> (accessed 17 May 2018).

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

NEW COUNTY AND HYDROMETRIC AREA RECORDS OF CHIRONOMIDAE (INSECTA: DIPTERA) IN IRELAND FROM RECENT AND PAST COLLECTIONS

D. A. Murray
Emeritus Associate Professor, Freshwater Biodiversity, Ecology and Fisheries Research Group, School of Biology and Environmental Science, University College Dublin, Belfield, Dublin 4, Ireland.
e-mail: <declan.murray@ucd.ie>
(address for correspondence: *Meadesbrook, Ashbourne, Co. Meath, A84 K727, Ireland*)

Abstract

Distribution data are given for 22 species of Chironomidae (Insecta: Diptera) in ten counties and eleven Hydrometric Areas in Ireland based on recent and past collections. New records are documented for Counties Cavan, Cork, Donegal, Galway, Kerry, Meath, Waterford and Wicklow, and Hydrometric Areas 8, 10, 17, 19, 20, 21, 26, 31 and 38. Additional records are given for species already on record in Counties Dublin and Roscommon and HAs 9 and 22.
Key words: Chironomidae, distribution, Ireland, County, Hydrometric Area.

Introduction

Comprehensive information on the distribution of species of Chironomidae (Insecta, Diptera) in Ireland, based on known records up to December 2017, was given by Murray *et al*. (2018). Further collection and continuing assembly of distribution records since then yielded additional information reported by Murray (2018), Murray and Langton (2018) and Murray and O'Connor (2018). This paper reports on new distribution data from collections in 2018 and 2019 in Counties Meath and Cork and from collections in earlier years in Counties Cavan, Donegal, Dublin, Galway, Kerry, Roscommon, Waterford and Wicklow based on examination of previously undetermined slide preparations, including some in the slide collection of Carmel F. Humphries from the 1940s. Two species records from Fota Island, County Cork are noted from specimens provided by Dr J. P. O'Connor (JPOC), emeritus entomologist, National Museum of Ireland – Natural History, from material collected by light-trap in April 2019 as part of the Rothamsted Insect Survey (RIS) in the Fota Wildlife Park. The RIS has been ongoing since 1964, principally to provide information to scientists, horticulturalists, conservation organizations, individuals and policy makers, on aphids, moths and other migrating insects (JPOC, *pers. comm*.). Residual specimens in the collections, that include caddisflies (Trichoptera), have been sent regularly to JPOC for identification who, while examining a sample collected in April 2019, noted several intact adult male chironomids that he kindly forwarded to the author. All records documented here extend knowledge on chironomid species

distribution in the above mentioned counties and in Hydrometric Areas 8, 9, 10, 17, 19, 20, 21, 22, 26, 31 and 38 (see <www.epa.ie> for details of HAs in Ireland).

Abbreviations used

AF - Alma Fitzgerald; BPH - Brian P. Hayes; CFH - C. F. Humphries; DAM - D. A. Murray; det.- determined by; EPA - Environmental Protection Agency; *et al*. - et alia; FC - Fiona Curran; HA - Hydrometric Area; ♂ - Adult male; JPOC - J. P. O'Connor; leg. - collected by; NOM - N. O'Maoiledigh; MG - M. Grey; *pers. comm.* - personal communication; Pe - pupal exuviae.

Methods

Unless otherwise stated identifications are by the author. Identifications of exuviae are largely from Langton and Visser (2003) while adult male Chironomidae were identified from Langton and Pinder (2007). Distribution data for each species are given by county, waterbody type, Hydrometric Area, location, Irish Grid Reference, stage (adult ♂ or Pe), date of collection and collector. Species records are treated alphabetically by genus in respective subfamilies following the taxonomic sequence in Murray *et al.* (2018).

Results

Records of 22 species of Chironomidae in the subfamilies Tanypodinae (2 species), Diamesinae (2 species), Orthocladiinae (11 species) and Chironominae (7 species) are documented from ten counties. New county records are noted for Counties Cavan, Cork, Donegal, Galway, Kerry, Meath, Waterford and Wicklow, and additional records are given for species already known in Counties Dublin and Roscommon. Similarly, among the 22 species documented here, new species records are noted for Hydrometric Areas 8, 10, 17, 19, 20, 21, 26, 31 and 38 while additional records are documented for HAs 9 and 22

SUBFAMILY TANYPODINAE

***Macropelopia* (*Macropelopia*) *adaucta* Kieffer, 1916**

DUBLIN: Upper Reservoir (HA 9), Bohernabreena (O095219), Pe 20 May 1947, leg. AF, det. CFH.

This record is based on a slide mounted pupal exuviae by Fitzgerald (1947) that was recently discovered in the C. F. Humphries slide collection. There are two other records of the species from April and June 1947 at this site, as well as records from peaty bog pools in the adjacent Dublin/Wicklow mountain region (Murray *et al*., 2013). The species is widespread in Ireland with more than 100 distribution records (Murray *et al*., 2018).

***Zavrelimyia* (*Zavrelimyia*) *nubila* (Meigen, 1830)**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), Pe and emerging ♂ 21 March 2019.

The pupal exuviae and emerging adult male of *Zavrelimyia nubila* were obtained from the water surface of a garden water barrel. This species has previously been documented at the same location during the months of April to September and this is the first record from the month of March. Pupal exuviae of *Metriocnemus carmencitabertarum* (Orthocladiinae) and *Paratanytarsus austriacus* (Chironominae – Tanytarsini) were also obtained in the collection in March 2019 (see below).

SUBFAMILY DIAMESINAE

***Protanypus morio* (Zetterstedt, 1838)**

WICKLOW: Poulaphuca Reservoir (HA 9), Ballymoreustace (N995080), Pe 10 September 1982, leg. BPH.

Recent examination of previously unidentified slide preparations of pupal exuviae collected by Hayes (1991) revealed this record of *Protanypus morio* from the Poulaphuca Reservoir. The species is already known from HA 9 and County Wicklow and from a number of locations in the adjacent HA 10. The earliest documented record of the species in Ireland is from June 1947 at the Bohernabreena Reservoir (HA 9), County Dublin (Fitzgerald, 1947; Murray *et al*., 2013).

***Pseudodiamesa* (*Pseudodiamesa*) *branickii* (Nowicki, 1873)**

WICKLOW: River Avoca (HA 10), Whitebridge, Tigroney (T198821), Pe 1 July 1997, leg. FC.

This record derives from previously unidentified pupal exuviae slide preparations of specimens by Fiona Curran (2001). The species is rare in Ireland with existing records from only five disjunct locations throughout the country, one of which is from the River Glencullen at Knocksink, County Wicklow in HA 10.

SUBFAMILY ORTHOCLADIINAE

***Brillia bifida* Kieffer, 1921**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ 9 March 2019.

There are multiple records of this rather common species at this location since July 1967 from where it was first documented under its synonym *Brillia modesta* (Murray, 1972). Prior to the present record, the species was last recorded at this location in November 2014 (Murray *et al*., 2018).

***Chaetocladius* (*Chaetocladius*) *perennis* (Meigen, 1830)**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ 4 April 2019.

There are two previous records of this species at this location, from May 2005 and March 2016. The first known record of *Chaetocladius perennis* in Ireland is from a pupal exuviae slide

preparation in the collections of C. F. Humphries from the aquaduct at Bohernabreena, County Dublin, in June 1946 (Murray *et al*., 2014).

***Cricotopus* (*Isocladius*) *speciosus* Goetghebuer, 1921 New to Counties Galway, Kerry and Waterford and Hydrometric Areas 17, 21 and 31**

GALWAY: Lough Anaserd (HA 31), Ballyconneely (L605443), Pe 10 July 2006, leg. EPA. **KERRY:** Lough Brin (HA 21), Derreeny (V780775), Pe 18 June 2008, leg. EPA. **WATERFORD:** Lough Carrigvantry (HA 17), Tramore (S548022), Pe 1 September 2009, leg. EPA.

There is only one existing record of *Cricotopus* (*I.*) *speciosus* in Ireland that was reported from Bleach Lake (HA 24), Pallaskenry, County Limerick (Murray, 2012a) and included in the recent checklist of Irish Chironomidae (Murray *et al*., 2018). Examination of previously undetermined slide preparations of pupal exuviae, prepared from collections by research officers of the Environmental Protection Agency, has yielded the three new distribution records for the species that are cited here.

***Heterotrissocladius marcidus* (Walker, 1856)**

WICKLOW: River Avonmore (HA 10), Lion Arch Bridge (T194833), Pe 27 October 1997, leg FC.

The record is from slide mounted and previously unidentified pupal exuviae collected by Fiona Curran (Curran, 2001). While this is the first documentation of the species from the River Avonmore, there is an existing record in HA 10 and County Wicklow from exuviae collected by P. Ashe from Lough Bray in April 1981.

***Metriocnemus* (*Inermipupa*) *carmencitabertarum* Langton and Cobo, 1997**

MEATH: Water barrel (HA 8), Meadesbrook, Ashbourne (O040594), ♂ and Pe 19 and 21 March 2019.

This is considered a recent immigrant species that was first documented in Ireland in HA 8 at Riverstown, County Meath in March 2012 (Murray, 2012b) and later from a water barrel at Meadesbrook in June 2012 (Murray, 2013). Records now exist from 13 locations in Ireland. The species exhibits flight periods of successive generations between March and December. Other chironomid species emerging simultaneously at Meadesbrook in 2019 were *Zavrelimyia nubila* (Tanypodinae) and *Paratanytarsus austriacus* Chironominae - Tanytarsini).

***Metriocnemus* (*Metriocnemus*) *atriclava* Kieffer, 1921 New to County Donegal and HA 38**

DONEGAL: River Owenveagh (HA 38), Glenveagh (B990178), ♂ 27 July 1985, leg. LH.

Recent examination of specimens collected by Heneghan (1986) revealed a slide preparation of an adult male, that had been provisionally determined as "*Metriocnemus* sp?", which is now positively identified as *Metriocnemus* (*M.*) *atriclava.* Existing records of this species are from Counties Cavan, Galway and Offaly and this is the first documentation of the species from County Donegal and HA 38.

***Orthocladius* (*Pogonocladius*) *consobrinus* (Holmgren, 1869)**

DUBLIN: Upper Reservoir (HA 9), Bohernabreena (O095219), Pe 20 May 1947, leg. CFH/AF.

This species is known from lakes and reservoirs throughout Ireland, predominantly in the northern two-thirds of the country (Murray *et al*., 2018). Other records for the species exist at Bohernabreena from November 1946 and April 1947 (Fitzgerald, 1947; Murray *et al*., 2014).

***Orthocladius* (*Symposiocladius*) *ruffoi* Rossaro and Prato, 1991 New to County Wicklow and HA 10**

WICKLOW: River Avonmore (HA 10), Lion Arch Bridge (T194833), Pe 27 October 1997, leg. FC.

Existing records of this species are predominantly from rivers and streams in coastal counties in the north, west and southwest of the country. The new record reported here extends its known Irish distribution to the east of the country in County Wicklow and HA 10.

***Pseudorthocladius* (*Pseudorthocladius*) *filiformis* (Kieffer, 1908)**

KERRY: Lough Leane (HA 22), Castlelough Bay Boathouse, Killarney (V965866), ♂ 29 August and 6 September 1987, leg. NOM.

These records come from examination of previously undetermined slide preparations by Niall O'Maoiledigh. This species was first documented in HA 22 and County Kerry in July 1973 from the adjoining Muckross Lake (Douglas and Murray, 1980; Murray *et al*., 2014).

***Smittia pratorum* (Goetghebuer, 1927) New to County Cork and HA 20**

CORK: Fota Wildlife Park (HA 20), Fota Island (W780710), ♂ 22 April 2019.

This is the first record of the species in County Cork and Hydrometric Area 20 and also represents the first record of the species in the south of Ireland, although it is known in south-west Ireland since May 1973 at Lough Reagh (HA 22), County Kerry (Douglas and Murray, 1980; Murray *et al*., 2014).The record at Fota Island is from specimens collected by light trap during the Rothamsted Insect Survey at the Fota Wildlife Park in April 2019. Insects in those collections were provisionally sorted by Adrian Reilly (JPOC *pers. comm*.) and adult Trichoptera, along with residual insects, were sent for identification to Dr J. P. O'Connor who noted some adult male chironomids in that material and kindly passed them to the author for identification.

MEATH: Meadesbrook (HA 8), Ashbourne, County Meath (O040594), ♂ 12 January, 26 February and 9 March 2019.

There are three previous records of *Smittia pratorum* at this location, from November 2005, December 2016 and February 1997.

***Tvetenia calvescens* (Edwards, 1929)**

DUBLIN: River Dodder (HA 9), Milltown, Dublin (O168303), Pe 4 January 1946, leg. and det. M. Grey.

A slide preparation of this specimen was recently discovered in the CFH slide archive. The collection by Grey (1946) from January 1946, that contained pupal exuviae of *Tvetenia calvescens*, provides the earliest confirmed record of the species in Ireland. Records exist from two years later at the same site in November 1948 and there are multiple records of the species in HA 9 and County Dublin, documented in Murray *et al*. (2014). This species is widespread in Ireland with records from 268 locations (Murray *et al*., 2018).

SUBFAMILY CHIRONOMINAE

Tribe Chironomini

***Chironomus* (*Chironomus*) *annularius* (Meigen, 1818) New to County Cavan and HA 26, New to County Meath and HA 8**

CAVAN: Lough Sheelin (HA 26), Kilnahard (N435860), ♂ 18 June 1984, leg. BPH. **MEATH:** Meadesbrook (HA 8), Ashbourne (O040594), ♂ 28 March 2019.

Chironomus annularius is already known from eight locations in five HAs in Ireland. It is considered to be a widespread but largely undocumented species. The new records presented here are based on identification of a previously unidentified slide preparation of an adult male, from Lough Sheelin, prepared by BPH and on an adult male, collected in March 2019, that was resting on the roof of a car outside the author's home in County Meath.

***Paratendipes albimanus* (Meigen, 1818)**

ROSCOMMON: River Suck (HA 26), Ballyforan (M817464), Pe 28 July 1982, leg. BPH, det. DAM.

This species was documented previously also from the River Suck in August 1981 (Hayes, 1991; Murray *et al*., 2015). The additional later record documented here comes from examination of unidentified slide preparations by BPH.

Tribe Tanytarsini

***Micropsectra atrofasciata* (Kieffer, 1911)**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ 29 October 2018.

This species is widely distributed in Ireland with records from 144 locations (Murray *et al*., 2018). There are multiple records of the species from this location, the first of which was in June 1968 (Murray, 1972).

***Micropsectra notescens* (Walker, 1856)**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ 9 March 2019.

Micropsectra notescens is known from 47 locations throughtout Ireland and there is one previous record of the species at this site from 1996.

***Micropsectra pallidula* (Meigen, 1830)**

CORK: Fota Wildlife Park (HA 20), Fota Island (W780710), ♂ 22 April 2019.

This record is from light trap material obtained during the Rothamsted Insect Survey collections that was provided by JPOC. The species is widespread in Ireland with existing records from more than 100 locations (Murray *et al*., 2018). An earlier record exists in HA 20, County Cork from August 1983 from the River Ilen at Drimoleague (Hayes, 1991; Murray *et al*., 2015).

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ 11 May 2019.

There are a number of records of *Micropsectra pallidula* at this site, the earliest from July 1968 under the synonym *M. bidentata* (Murray,1972).

***Paratanytarsus austriacus* (Kieffer, 1924)**

MEATH: Meadesbrook (HA 8), Ashbourne (O040594), ♂ and Pe 21 March 2019.

Pupal exuviae and emerging adult male specimens were collected on the water surface of a rainwater-filled water tank. Pupal exuviae of *Zavrelimyia nubila* and *Metriocnemus carmencitabertarum* were taken in the same collection (see above).

***Stempellina almi* Brundin, 1947 New to County Cork and HA 19**

CORK: Iniscarra Reservoir (HA 19), Coachford (W477717), Pe 16 September 2008, leg. EPA.

The first records of this species in Ireland were from collections of pupal exuviae by research officers of the Environmental Protection Agency for CPET analyses (Murray, 2010). Analyses of pupal exuviae for CPET monitoring of lotic and lentic waters (Wilson and Ruse, 2005) are based largely on identification to genus level only and consequently in the original examination of samples provided by the EPA, a number of slide preparations were only identified to genus pending further detailed examination for species inventory. The specimens that give this new species record for County Cork, and HA 19, had been labelled thus at the time of original examination in 2008 but a recent review of the material provided the positive identification of *Stempellina almi* from the Iniscarra Reservoir.

Acknowledgements

Thanks are due to Dr J. P. O'Connor, Emeritus Entomologist at the National Museum of Ireland - Natural History, Dublin, who provided specimens obtained during the Rothamsted Insect Survey at Fota Wildlife Park, County Cork and to field research staff of the Environmental Protection Agency for pupal exuviae samples from lakes in Counties Galway, Kerry and Waterford.

References

Curran, F. T. C (2001) *Ecological and ecotoxicological investigations of ongoing discharge of acid mine drainage* (AMD) *from the abandoned Avoca copper mines, Co. Wicklow*. Ph.D. thesis, Department of Zoology, University College Dublin.

Douglas, D. J. and Murray, D. A. (1980) A checklist of the Chironomidae of the Killarney Valley Catchment. Pp 123-129. *In* Murray, D. A. (Ed.) *Chironomidae: ecology, systematics, cytology and physiology*. Pergamon Press, London.

Fitzgerald, A. M. (1947) *An investigation of the chironomid fauna of the River Dodder* (*upper reaches*). M.Sc. thesis, Department of Zoology, University College, Dublin.

Grey, M. (1946) *An investigation of the chironomid fauna of the River Dodder* (*lower reaches*). M.Sc. thesis, Department of Zoology, University College Dublin.

Hayes, B. P. (1991) *Studies on the Chironomidae (Diptera: Insecta) of Irish rivers, based on collections of pupal exuviae*. Ph.D. thesis, Department of Zoology, University College Dublin.

Heneghan, L. (1986) *The Chironomidae (Diptera) of Glenveagh National Park, Co. Donegal: an annotated inventory.* M.Sc. thesis, Department of Zoology, University College Dublin.

Langton, P. H. and Pinder, L. C. V. (2007) Keys to the adult male Chironomidae of Britain and Ireland. *Scientific Publications of the Freshwater Biological Association* **Number 64**. Two volumes. Volume 1: 1-239. Volume 2: 1-168.

Langton, P. H. and Visser, H. (2003) *Chironomidae exuviae - A key to pupal exuviae of the West Palaearctic Region*. Interactive System for the European Limnofauna Biodiversity Centre of ETI, UNESCO Publishing, Paris.

Murray, D. A. (1972) A list of the Chironomidae (Diptera) known to occur in Ireland with notes on their distribution. *Proceedings of the Royal Irish Academy* **72B**: 275-293.

Murray, D. A. (2010) Records of Chironomidae (Diptera) in Ireland – twenty additions and notes on four morphotypes. *Bulletin of the Irish Biogeographical Society* **34**: 85-96.

Murray, D. A. (2012a) Four Chironomidae new to Ireland in the subfamilies Orthocladiinae and Chironominae and a new site record for *Parochlus kiefferi* (Garrett, 1925) (Podonominae). *Bulletin of the Irish Biogeographical Society* **36**: 8-14.

Murray, D. A. (2012b) First record of *Metriocnemus (Inermipupa) carmencitabertarum* Langton and Cobo 1997 (Diptera: Chironomidae, Orthocladiinae) for Ireland. *Bulletin of the Irish Biogeographical Society* **36**: 3-7.

Murray, D. A. (2013) Supplementary records of *Metriocnemus* (*Inermipupa*) *carmencitabertarum* Langton and Cobo, 1997 (Diptera: Chironomidae, Orthocladiinae) in Ireland with some observations on larval behaviour. *Bulletin of the Irish Biogeographical Society* **37**: 201-204.

Murray, D. A. (2018) Further distribution records of Chironomidae (Insecta: Diptera) in Ireland from past collections. *Bulletin of the Irish Biogeographical Society* **42**: 58-74.

Murray, D. A. and Langton, P. H. (2018) Doubt and certainty in records of *Micropsectra recurvata* Goetghebuer (Insecta: Diptera: Chironomidae) in Ireland. *Bulletin of the Irish Biogeographical Society* **42**: 155-158.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2013) Distribution records of Irish Chironomidae (Diptera): part 1 – Buchonomyiinae: Podonominae, Tanypodinae, Telmatogetoninae, Diamesinae and Prodiamesinae. *Bulletin of the Irish Biogeographical Society* **37**: 208-336.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2014) Distribution records of Irish Chironomidae (Diptera): part 2 – Orthocladiinae. *Bulletin of the Irish Biogeographical Society* **38**: 61-246.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2015) Distribution records of Irish Chironomidae (Diptera): part 3 – Chironominae. *Bulletin of the Irish Biogeographical Society* **39**: 7-192.

Murray, D. A. and O'Connor, J. P. (2018). Distribution records of Chironomidae (Insecta: Diptera) in Ireland from recent collections. *Bulletin of the Irish Biogeographical Society* **42**: 34-44.

Murray, D. A., O'Connor, J. P. and Ashe P. (2018) Chironomidae (Diptera) of Ireland - a review, checklist and their distribution in Europe. *Occasional Publication of the Irish Biogeographical Society* **Number 12**. Published by the Irish Biogeographical Society in association with University College Dublin and the Environmental Protection Agency. 404 pp.

Wilson, R. S. and Ruse, L. P. (2005) A guide to the identification of genera of chironomid pupal exuviae occurring in Britain and Ireland (including common genera from northern Europe) and their use in monitoring lotic and lentic waters. *Freshwater Biological Association, Special Publication* **13**: 1-176.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

RECORDS OF CADDISFLIES (TRICHOPTERA) FROM COUNTY ANTRIM, NORTHERN IRELAND

James P. O'Connor[1] and Cathal McNaughton[2]
[1]*Emeritus Entomologist, National Museum of Ireland – Natural History, Merrion Street, Dublin 2, Ireland.*
e-mail:<joconnor@museum.ie>
[2]*5 Middlepark Crescent, Cushendall, Co. Antrim BT44 0SD, Northern Ireland.*
e-mail: <cathalger@hotmail.co.uk>

Abstract

New records of caddisflies (Trichoptera) are noted from County Antrim, Northern Ireland, many from the Garron Plateau. *Limnephilus borealis* (Zetterstedt, 1840) is reported from four new lakes on the plateau. Four species are new to the County *viz. Holocentropus dubius* (Rambur, 1842), *Lype phaeopa* (Stephens, 1836), *Ceraclea fulva* (Rambur, 1842) and *C. nigronervosa* (Retzius, 1783).

Key words: Trichoptera, caddisflies, Northern Ireland, County Antrim, Garron Plateau, new records, *Limnephilus borealis*.

Introduction

Most of the records are from the Garron Plateau, a basaltic headland area undulating to a maximum height of 440m but generally lying between 330 and 380m with scarps to Glenariff Glen and the Antrim coast and a gentler descent inland. The Upper Basalts predominate with limited exposure of the Lower Basalts. The blanket bog, which covers much of the plateau, is the largest intact bog in Northern Ireland. The peatland structure is highly diverse with hummock, lawn and pool complexes on the deepest peats grading into large expanses of blanketing peats on low gradients to heathland communities on the steepest and more exposed slopes. Several lakes on the site have characteristically nutrient poor waters with some conforming to EU 'Habitats Directive' Annex I types. Elsewhere, locally mineral enriched flushing provides the alkaline fens priority habitat and in hollows on the wetter more level parts of the blanket bog, the influence of mineral rich water provides the transition mires and quaking bog systems. The area is a Special Area of Conservation (Anon., 2019).

For many years, CMcN has been collecting caddisflies in this area particularly at the lakes and has made notable discoveries. The most interesting find was that of *Limnephilus borealis* (Zetterstedt, 1840) which was a species new to Ireland (O'Connor and McNaughton, 2017a, 2018). Other records will be found in O'Connor and McNaughton (2017b, c) and O'Connor, O'Connor and McNaughton (2018). In this paper, four species have been added to the County

Antrim fauna from the Garron Plateau. There are also records from other localities in the county.

The specimens were determined by JPOC using Malicky (2004), Barnard and Ross (2012) and Salokannel and Mattila (2018). Voucher material of the rarer species has been retained in the O'Connor collection.

The records

RHYACOPHILIDAE

***Rhyacophila dorsalis* (Curtis, 1834)**

ANTRIM: Aghalum, Carnlough (D2518), 1♂ 22 June 2019; Glenarm River (D3014), 3♂♂1♀ 4 September 2019.

GLOSSOSOMATIDAE

***Agapetus fuscipes* Curtis, 1834 (Fig. 1)**

ANTRIM: Lough na Trosk, Garron Plateau (D2719), 1♂ 15 July 2019.

Although a widespread Irish species, this is the first record of *Agapetus fuscipes* from the Plateau.

HYDROPTILIDAE

***Agraylea multipunctata* Curtis, 1834**

ANTRIM: Kilgad (Riversdale) Lake (J1798), Kells, 1♂ 1 August 2019.

PHILOPOTAMIDAE

***Philopotamus montanus* (Donovan, 1813)**

ANTRIM: stream from Lough na Tullig, Garron Plateau (D2521), 1♂ 9 May 2019; Glenarm River (D3014), ♂ 7 July 2019.

POLYCENTROPODIDAE

***Cyrnus trimaculatus* (Curtis, 1834)**

ANTRIM: Glendun River, Knocknacarry (D2332), 5♂♂ 12 July 2019; Lough na Bric, Garron Plateau (D2519), 1♂ 29 June 2019; Lough Fine, Garron Plateau (D2620), 1♂ 3 July 2019.

***Holocentropus dubius* (Rambur, 1842) New to County Antrim (Fig. 2)**

ANTRIM: Lough Fad, Garron Plateau (D2519), 1♀ 13 July 2019.

Holocentropus dubius was previously only known in Northern Ireland from Mill Lough, County Fermanagh (H2438).

***Plectrocnemia conspersa* (Curtis, 1834)**
ANTRIM: Dungonnell Dam near Cargan (D1917), 2♂♂ 7 June 2019; Lough Fad, Garron Plateau (D2519), 2♀♀ September 2019; Lough na Bric, Garron Plateau (D2519), 1♀ 5 September 2019.
***Plectrocnemia geniculata* McLachlan, 1871**
ANTRIM: Trosk marsh, Garron Plateau (D2719), 1♂ 22 June 2019.
***Polycentropus flavomaculatus* (Pictet, 1834)**
ANTRIM: Glenarm River (D3014), 1♂ 7 July 2019; Glendun River, Knocknacarry (D2332), 3♂♂ 12 July 2019; Limerick Point, Cushendall (D2427), 2♀♀ 14 July and 1♀ 15 July 2019; Lough na Bric, Garron Plateau (D2519), 1♀ 16 June 2019.

PSYCHOMYIIDAE

***Lype phaeopa* (Stephens, 1836) New to County Antrim (Fig. 3)**
ANTRIM: Lough na Trosk, Garron Plateau (D2719), 3♀♀ 15 July 2019.
***Psychomyia pusilla* (Pictet, 1834)**
ANTRIM: Glendun River, Knocknacarry (D2332), 4♂♂2♀♀ 12 July 2019 .
***Tinodes waeneri* (Linnaeus, 1758)**
ANTRIM: Glendun River, Knocknacarry (D2332), 4♂♂2♀♀ 12 July 2019; Lough Galboly, Garron Plateau (D2823), 3♂♂ 28 August 2019; Loughisland, Garron Plateau (D2519), 1♂1♀ 27 August 2019.

PHRYGANEIDAE

***Agrypnia obsoleta* (Hagen, 1864)**
ANTRIM: Lough Galboly, Garron Plateau (D2823), 3♂♂2♀♀ 28 August 2019; Lough na Bric, Garron Plateau (D2519), 3♂♂ 20 September 2018; Loughisland, Garron Plateau (D2519), 2♂♂3♀♀ 27 August 2019.

GOERIDAE

***Goera pilosa* (Fabricius, 1775)**
ANTRIM: Kilgad (Riversdale) Lake (J1798), Kells, 1♂ 25 June 2019.
***Silo pallipes* (Fabricius, 1781)**
ANTRIM: Trosk stream, Garron Plateau (D2719), 1♀ 29 June 2019.

LEPIDOSTOMATIDAE

***Lepidostoma hirtum* (Fabricius, 1775)**
ANTRIM: Glendun River, Knocknacarry (D2332), 1♂ 12 July 2019 .

LIMNEPHILIDAE

***Drusus annulatus* (Stephens, 1837)**

ANTRIM: Glenarm River (D3014), 3♂♂1♀ 4 September 2019.

***Chaetopteryx villosa* (Fabricius, 1798)**

ANTRIM: stream in Falmabreed, Glenariff (D2524), 1♂ 20 October 2018.

***Anabolia nervosa* (Curtis, 1834)**

ANTRIM: Lough Fad, Garron Plateau (D2519), 5♂♂1♀ 5 September 2019; Lough na Bric, Garron Plateau (D2519), 4♂♂4♀♀ 20 September 2018, hand-collected.

***Limnephilus borealis* (Zetterstedt, 1840) (Plate 1)**

ANTRIM: Lough Fad, Garron Plateau (D2519), 2♂♂ 5 September 2019; Lough Galboly, Garron Plateau (D2823), 2♀♀ 28 August 2019; Lough na Bric, Garron Plateau (D2519), 1♀ 5 September 2019; Loughisland, Garron Plateau (D2519), 5♂♂ 2♀♀ 27 August 2019.

Limnephilus borealis was previously only recorded in Ireland from Loughs Garve and Natullig on the Garron Plateau. With the discovery of the species in the above water-bodies, it is now from six lakes there.

***Limnephilus hirsutus* (Pictet, 1834)**

ANTRIM: Aghalum, Carnlough (D2518), 2♂♂ 22 June 2019.

***Limnephilus lunatus* Curtis, 1834**

ANTRIM: Lough Galboly, Garron Plateau (D2823), 1♀ 28 August 2019.

***Limnephilus luridus* Curtis, 1834**

ANTRIM: Lough Beg road (H9994), Moneyglass, 1♂ 6 July 2019; marsh on the western fringe of Lough na Trosk (D2719), Garron Plateau, 1♂ 22 June 2019, swept.

***Limnephilus nigriceps* (Zetterstedt, 1840)**

ANTRIM: Lough na Bric, Garron Plateau (D2519), 2♂♂ 20 September 2018, hand-collected.

***Limnephilus sparsus* Curtis, 1834**

ANTRIM: bog near Lough Beg (H9994), 1♂1♀ 19 June 2019, swept.

***Limnephilus stigma* Curtis, 1834**

ANTRIM: Loughisland, Garron Plateau (D2519), 3♀♀ 27 August 2019.

***Limnephilus vittatus* (Fabricius, 1798)**

ANTRIM: Lough Galboly, Garron Plateau (D2823), 2♂♂3♀♀ 28 August 2019.

***Halesus digitatus* (Schrank, 1781)**

ANTRIM: Cushendall River (D2327), 1♀ 6 November 2018, collected at a petrol station; Laragh Lodge Restaurant, Glenariff (D2120), 3♀♀ 3 November 2018.

***Halesus radiatus* (Curtis, 1834)**

ANTRIM: Craigagh Wood, Cushendun (D2232), 1♀ 3 October 2018, 6 watt light-trap; Lough Fad, Garron Plateau (D2519), 1♂1♀ 5 September 2019; Lough na Bric, Garron Plateau

(D2519), 1♂ 20 September 2018, hand-collected; Loughisland, Garron Plateau (D2519), 1♂1♀ 27 August 2019.

***Micropterna sequax* McLachlan, 1875**

ANTRIM: tributary stream, Glenariff River (D2325), Foriff, Waterfoot, 3♂♂ 9 July 2019.

***Potamophylax cingulatus* (Stephens, 1837)**

ANTRIM: Lough na Trosk, Garron Plateau (D2719), 1♂ 10 September 2019.

SERICOSTOMATIDAE

***Sericostoma personatum* (Spence, 1826)**

ANTRIM: Lough na Trosk, Garron Plateau (D2719), 1♀ 3 July 2019, swept.

BERAEIDAE

***Berea maurus* (Curtis, 1834)**

ANTRIM: Lough na Trosk, Garron Plateau (D2719), 2♂♂1♀ 15 July 2019.

LEPTOCERIDAE

***Athripsodes aterrimus* (Stephens, 1836)**

ANTRIM: Kilgad (Riversdale) Lake (J1798), Kells, 1♂1♀ 25 June 2019; Lough na Bric, Garron Plateau (D2519), 3♂♂ 29 June 2019, swept.

***Ceraclea fulva* (Rambur, 1842) New to County Antrim (Fig. 4)**

ANTRIM: Lough na Trosk, Garron Plateau (D2719), 1♀ 1 August 2017, light-trap, 1♀ 3 September 2017, 2♂♂1♀ 8 September 2018.

***Ceraclea nigronervosa* (Retzius, 1783) New to County Antrim (Fig. 5) (Plate 2)**

ANTRIM: Lough na Bric, Garron Plateau (D2519), adult 12 July 2013, determined C. McNaughton, confirmed I. D. Wallace from a photograph on iSpot <https://www.ispotnature.org/communities/uk-and-ireland/view/observation/191487/ceraclea-nigronervosa>.

***Mystacides azurea* (Linnaeus, 1761)**

ANTRIM: Loughisland, Garron Plateau (D2519), 2♂♂1♀ 27 August 2019.

***Mystacides longicornis* (Linnaeus, 1758) (Fig. 6) (Plate 3)**

ANTRIM: Kilgad (Riversdale) Lake (J1798), Kells, 1♂ 25 June 2019, swept; Limerick Point, Cushendall (D2427), 1♂ 10 July 2019, a pale yellow wing form lecking on a rocky beach with brackish pools (Fig. 6); Lough na Bric, Garron Plateau (D2519), 3♂♂ 29 June 2019, swept.

***Oecetis lacustris* (Pictet, 1834)**

ANTRIM: Lough Fadden, Garron Plateau (D1842), 2♂♂1♀, 22 July 2019.

***Oecetis ochracea* (Curtis, 1825)**

ANTRIM: Lough Fad, Garron Plateau (D2519), 1♂ 20 August 2019; Lough na Bric, Garron Plateau (D2519), 1♀ 29 June 2019, swept.

Acknowledgements

The authors are grateful to Dr Ian Wallace for confirming the identity of the Antrim *Ceraclea nigronervosa*. We also wish to thank Dr Alan Morton for providing the relevant software programme used in the preparation of the distribution maps with DMAP.

References

Anon., 2019. Garron Plateau SAC. Department of Agriculture, Environment and Rural Affairs. < https://www.daera-ni.gov.uk/protected-areas/garron-plateau-sac> (accessed 18 July 2019).

Barnard, P. and Ross, E. (2012) The adult Trichoptera (caddisflies) of Britain and Ireland. *Handbooks for the Identification of British Insects* **1**(17): i-iv, 1-192.

Malicky, H. (2004) *Atlas of European Trichoptera.* 2nd edition. Springer, Dordrecht.

O'Connor, J. P. and McNaughton, C. (2017a) The caddisfly *Limnephilus borealis* (Zetterstedt, 1840) (Trichoptera: Limnephilidae): an unexpected addition to the Irish fauna. *Entomologist's Record and Journal of Variation* **129**: 306-310.

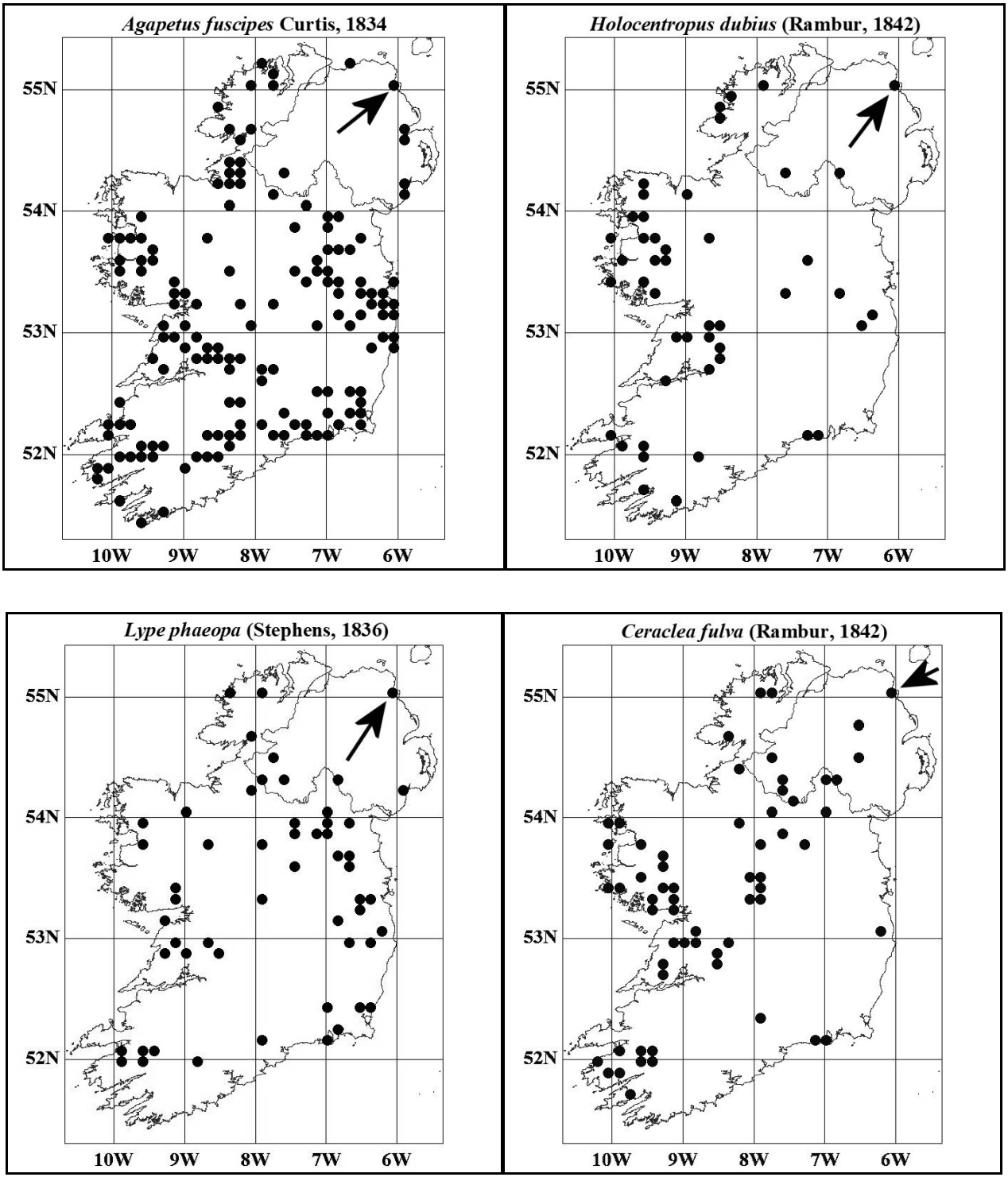
O'Connor, J. P. and McNaughton, C. (2017b) *Limnephilus hirsutus*, *Limnephilus ignavus* and *Ceraclea albimacula* (Trichoptera): three species new to Northern Ireland along with some other records from Lough na Trosk, County Antrim. *Bulletin of the Irish Biogeographical Society* **41**: 33-38.

O'Connor, J. P. and McNaughton, C. (2017c) Some new distributional records of caddisflies (Trichoptera) from Northern Ireland. *Bulletin of the Irish Biogeographical Society* **41**: 103-111.

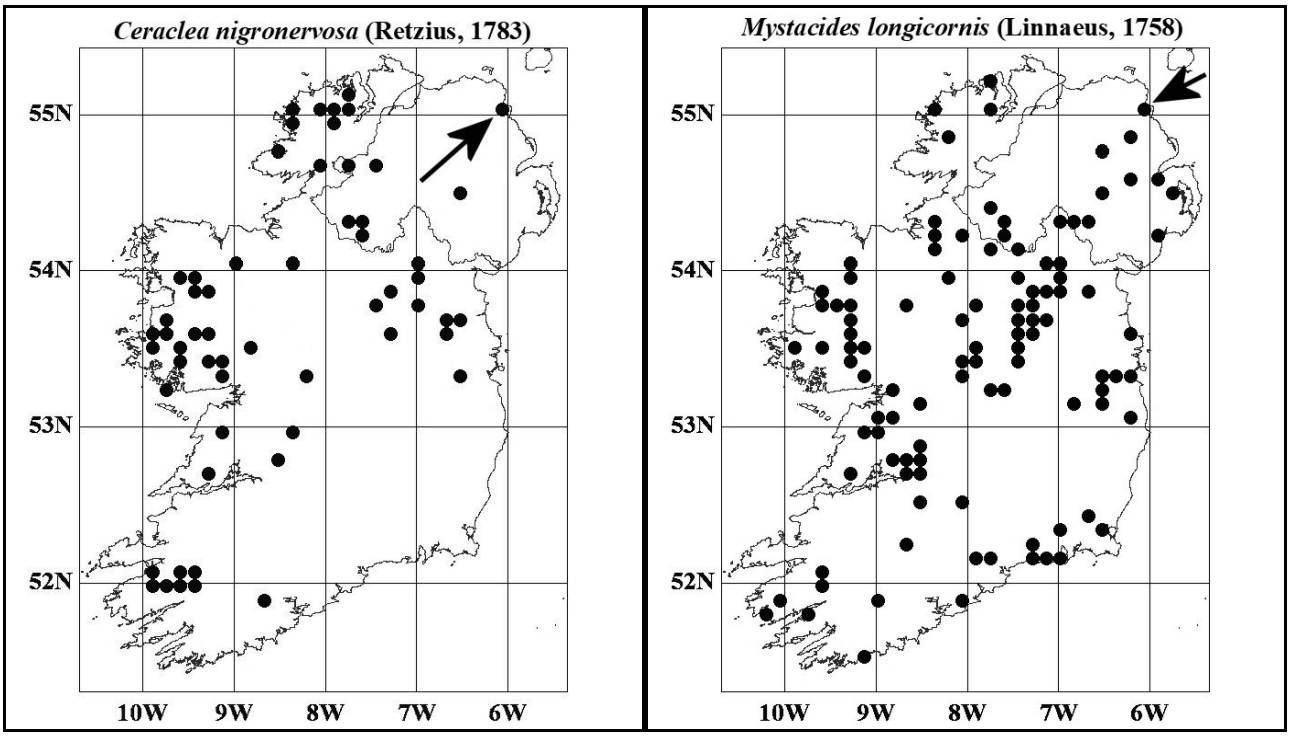
O'Connor, J. P. and McNaughton, C. (2018) A second Irish record of *Limnephilus borealis* (Zetterstedt, 1840) (Trichoptera: Limnephilidae) from Northern Ireland. *Entomologist's Monthly Magazine* **154**: 125-128.

O'Connor, J. P., O'Connor, M. A. and McNaughton, C. (2018) *Holocentropus dubius* (Rambur, 1842) new to Northern Ireland with other caddisfly (Trichoptera) records from the region. *Bulletin of the Irish Biogeographical Society* **42**: 22-33.

Salokannel, J. and Mattila, K. (2018) *Suomen vesiperhoset. Trichoptera of Finland*. Hyönteistarvike Tibiale Oy, Helsinki.



FIGURES 1-4. The known Irish distributions of *Agapetus fuscipes* Curtis, 1834, *Holocentropus dubius* (Rambur, 1842), *Lype phaeopa* (Stephens, 1836) and *Ceraclea fulva* (Rambur, 1842). The notable records are indicated by arrows.



FIGURES 5-6. The known Irish distributions of *Ceraclea nigronervosa* (Retzius, 1783) and *Mystacides longicornis* (Linnaeus, 1758). The notable records are indicated by arrows.

PLATE 1. *Limnephilus borealis*, Lough Fad, Garron Plateau, County Antrim, 6 September 2019. Photograph © Cathal McNaughton.

PLATE 2. *Ceraclea nigronervosa*, Lough na Bric (D2519), County Antrim, 12 July 2013. Photograph © Cathal McNaughton.

PLATE 3. *Mystacides longicornis*, ♂ pale yellow wing form, Limerick Point, Cushendall (D2427), County Antrim, 10 July 2019. Photograph © Cathal McNaughton.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

FIRST RECORD OF A PECAN NUT *CARYA ILLINOINENSIS* (VON WANGENHEIM) K. KOCH (JUNGLANDACEAE: HICORIEAE: APOCARYA) DRIFT ENDOCARP FROM IRISH WATERS AND A REVIEW OF NW EUROPEAN RECORDS OF *CARYA* ENDOCARPS

*Declan T. G. Quigley[1] and Dan Minchin[2]
[1]*Sea Fisheries Protection Authority, Eastern Region, West Pier, Howth, Co. Dublin, Ireland.*
[2]*Marine Organism Investigations, Ballina, Killaloe, Co. Clare, Ireland.*
*Corresponding author e-mail: <declan.quigley@sfpa.ie>

Abstract

On 8 December 1988, DM discovered an endocarp of a Pecan Nut *Carya illinoinensis* measuring 42mm in length and 24mm in diameter stranded on the Long Strand (W330340; 51.5630°N, 8.9826°W), near Castlefreke, County Cork, on the SW coast of Ireland. The specimen, which represents the first record of a *C. illionoensis* drift endocarp from Irish waters and the sixth from NW Europe, was donated to the National Herbarium, Dublin (DBN 2019). The occurrence of *C. illinoinensis* and other *Carya* drift endocarps from NW European waters is reviewed.

Key words: Pecan Nut, *Carya illinoinensis*, drift endocarps, Irish and NW European waters.

Introduction

The Hickory genus *Carya*, one of eight genera within the Walnut family (Junglandaceae), exhibits an intercontinentally disjunct distribution between subtropical and tropical regions of eastern Asia (5 species) and temperate to subtropical regions of eastern North America (12 species) (Manning, 1978; Zhang *et al*., 2013).

Twelve endemic species of *Carya* are known to occur within hydrographic catchments draining into the North Western Atlantic Ocean and Gulf of Mexico (Manning, 1978), including Pecan Nut *C. illinoinensis* (von Wangenheim) K. Koch (Iowa to N Mexico), Water Hickory *C. aquatica* (Michaux) Nuttall (SE Virginia to E Texas), Bitternut *C. cordiformis* (von Wangenheim) K. Koch (Quebec to E Texas), Black Hickory *C. texana* Buckley (1861) (southern Great Plains to lower Mississippi Valley), Sand Hickory *C. pallida* (Ashe) Engelmann & Graaebn. (SE U.S.A.), Scrub Hickory *C. floridana* Sargent (Florida), Nutmeg Hickory *C. myristicformis* (Michaux.) Elliott (1824) (SE U.S.A. to N Mexico), Mockernut *C. tomentosa* Sargent (Ontario to Texas), Red Hickory *C. ovalis* (Wangenheim) Sargent (Ontario to E Texas), Shagback Hickory *C. ovata* (Miller) K. Koch (SE Canada and E U.S.A.), Big Shellbark Hickory *C. laciniosa* (Miller) K. Koch (New York to Oklahoma) and Pignut *C. glabra* Miller (Ontario to E Texas).

At least eight North American species of *Carya* have been introduced and are currently cultivated in NW Europe, including *C. illinoinensis, C. aquatica, C. cordiformis, C. tomentosa, C. ovalis, C. ovata, C. laciniosa,* and *C. glabra* (Johnson and More, 2006). Five of these species are well established under ambient conditions in the National Botanic Gardens in Dublin (DBN), including *C. cordiformis* (as *C. minima*), *C. tormentosa* (as *C. alba*), *C. ovata, C. laciniosa,* and *C. glabra* (Anon., 2015).

Pecan trees are relatively large, reaching up to 52m in height within its native North American range (Iowa to N Mexico), but European specimens rarely produce fruit (Johnson and More, 2006). The pale to dark brown smooth endocarps, shaped like rugby balls, measure up to 30mm in length and 20mm in diameter, and depending on the amount of erosion, may have either pointed or rounded ends (Nelson, 2000). The kernels within the endocarp are a popular food worldwide.

Pecan Nut *Carya illinoinensis* drift endocarps from Irish and NW European waters

On 8 December 1988, DM discovered an endocarp of *Carya illinoinensis* measuring 42mm in length and 24mm in diameter stranded on the Long Strand (W330340; 51.5630°N, 8.9826°W), near Castlefreke, County Cork, on the SW coast of Ireland (Plate 1). The specimen, which represents the first record of a *C. illionoensis* drift endocarp from Irish waters and the sixth from NW Europe, was donated to the National Herbarium, Dublin (DBN 2019).

Details of all known NW European records of stranded *C. illionoensis* drift endocarps are summarized in Table 1. A total of six drift endocarps have been recorded since 1894, including three from the U.K., two from the Netherlands and one from Ireland.

Discussion

Although twelve endemic species of *Carya* are known to occur within hydrographic catchments draining into the North Western Atlantic Ocean and Gulf of Mexico, and eight of these are known to be cultivated in NW Europe (Johnson and More, 2006), only stranded endocarps belonging to four species (Plate 2) have been recorded from the Western Atlantic (*C. illinoinensis*, *C. aquatic*, *C. glabra* and *C. tomentosa)* (Gunn, 1968; Burkhalter and Wright, 1989; Zies, 1997; Gunn and Dennis, 1973, 1999; Sullivan, 2003; Perry and Dennis, 2010), and only two of these from the Eastern Atlantic (*C. illinoinensis* and *C. aquatica*).

While some of the NW European endocarps of *C. illinoinensis* may have been locally discarded, others probably represent true peregrine trans-Atlantic drifters. According to Nelson (2000), pecan endocarps can remain afloat in salt water for a year and are capable of drifting from the eastern U.S.A. to NW Europe. However, endocarps stranded on NW European beaches are unlikely to be viable.

There are only two confirmed records of stranded endocarps of *C. aquatica* from NW Europe, both from Cornwall, U.K. (Dennis, 2000; Gainey, 2014). However, Nelson (2000) noted that there was one unconfirmed report from Connemara, County Galway, on the west coast of Ireland.

The absence of stranded endocarps of *C. glabra, and C. tomentosa* from NW European waters may be related to either poorer buoyancy or a lack of recording effort. Gunn and Dennis (1999) noted that the endocarps of *C. glabra* and *C. tomentosa* usually have open sutures which may limit their long-term buoyancy and ability to float from North America to Europe.

Acknowledgements

We are grateful to the following for their help: Ed Perry (Melbourne Beach, Florida, U.S.A.) and Raymond van der Ham (Naturalis Biodiversity Centre, Leiden, Netherlands) for confirming the identity of the current specimens, Paul Gainey (Penryn, Cornwall, U.K.) for details on Cornish specimens, Matthew Jebb and Colin Kelleher (Botanic Gardens, Glasnevin, Dublin) for facilitating access to the carpological collections in the National Herbarium, Dublin, Chilekwa Chisala (Vlaams Instituut voor de Zee vzw Flanders Marine Institute, Oostende, Belgium) for sourcing references, Hannah Clarke (King's Museum, University of Aberdeen, Scotland) for details and images of the Scottish specimen, and Laura Urbonaviciene (SFPA Howth) for images of the Irish specimen.

References

Anon. (2015) National Botanic Gardens, Glasnevin. Far Grounds – *Aesculus, Betula* etc. (A4) Loc. 5. Last updated: April 2015.

Burkhalter, J.R. and Wright, J.C. (1989) Fourteen additions to the known stranded seeds and fruits of northwest Florida beaches. *Sida* **13**: 345-349.

Dennis, J. V. (2000) The Lucky Bean. *The Drifting Seed* **6**: 8-9.

Gainey, P. A. (2014) Drift seeds on Cornish strandlines. *The Drifting Seed* **20**: 9-11.

Gunn, C. R. (1968) Stranded seeds and fruits from the southeastern shore of Florida. *Garden Journal* **18**: 43-54.

Gunn, C. R. and Dennis, J. V. (1973) Tropical and temperate stranded seeds and fruits from the Gulf of Mexico. *Contributions in Marine Science* **17**: 111-121.

Gunn, C. R. and Dennis, J. V. (1999) *World guide to tropical drift seeds and fruits*. Malabar, Florida: Krieger Publishing Company. 240pp.

Johnson, O. and More, D. (2006) *Collins Tree Guide*. HarperCollins, London. 464pp.

Manning, W. E. (1978) The classification within the Juglandaceae. *Annals of the Missouri Botanical Garden* **65**: 1058-1087.

Morgan, I. (1991) Drift-seeds in Carmarthenshire. *Llanelli Naturalists' Newsletter* **(Winter 1991-1992)**: 13-15.

Nelson, E. C. (1990) Exotic drift fruits and seeds from the coasts of Britain and adjacent islands. *Journal of the Royal Institution of Cornwall* (New Series) **10**: 147-177.

Nelson, E. C. (2000) *Sea Beans and Nickar Nuts. A handbook of exotic seeds and fruits stranded on beaches in north-western Europe*. BSBI Handbook **No. 10**. Botanical Society of the British Isles, London. 156pp.

Perry, E. and Dennis, J. V. (2010) *Sea-beans from the tropics: a collector's guide to sea-beans and other tropical drift on Atlantic shores*. Krieger Publishing Company, Malabar, Florida. 217pp.

Sullivan, G. (2003) Sea-Bean Collection at University of Texas at Austin Marine Science Institute. *The Drifting Seed* **9**: 7-9.

Van der Ham, R., Cadée, G. C. and Kruiswijk, W. (2013) Walnoten, pecannoten en een vieugelnoot van de Nederlandse kust. *Het Zeepaard* **73**: 96-103.

Zhang, J.-B., Li, R.-Q., Xiang, X.-G., Manchester, S. R., Lin, L., Wang, W., Wen, J. And Chen, Z.-D. (2013) Integrated fossil and molecular data reveal the biogeographic diversification of the Eastern Asian-Eastern North American disjunct Hickory Genus (*Carya* Nutt.). *PlosOne* **8**: 13pp.

Zies, P. (1997) Florida Drift Seeds. *The Drifting Seed* **3**: 6-7.

TABLE 1. NW European records of stranded Pecan Nut *Carya illinoinensis* endocarps.

1. *Date*: 1894. *Location*: Carmarthenshire, Wales, UK. *Latitude ^{o}N & Longitude*: 51.6670 & 4.5000. *Reference*: Morgan (1991).

2. *Date*: 1908-1919. *Location*: north shore, Stornway, Isle of Lewis, Outer Hebrides, Scotland, U.K. *Latitude ^{o}N & Longitude*: 58.2094 & 6.3849. *TL (mm)*: 35. *Diameter (mm)*: 17. *Collector*: William L. MacGillivray. *Voucher Details*: King's Museum, Aberdeen (ABDUZ:50086.22). *Reference*: Nelson (1990).

3. *Date*: 1930. *Location*: Mullion, Lizard Peninsula, Cornwall, U.K. *Latitude ^{o}N & Longitude*: 50.0280 & 5.2405. *Reference*: Nelson (1990).

4. *Date*: 1970s. *Location*: between Bergen aan Zee and Schoorl, The Netherlands. *Latitude ^{o}N & Longitude*: 52.6610 & -4.6318. *TL (mm)*: 33. *Collector*: Jan Sterringa/Gerhard Cadee. *Reference*: Van der Ham *et al.* (2013).

5. *Date*: 1970s. *Location*: Zandvoort, The Netherlands. *Latitude ^{o}N & Longitude*: 52.3711 & -4.5334. *Collector*: Wim Kuijper. *Reference*: Van der Ham *et al.* (2013).

6. *Date*: 8 December 1988. *Location*: Long Strand, Castlefreke, County Cork, Ireland. *Latitude ^{o}N & Longitude*: 51.5630 & 8.9826. *TL (mm)*: 42. *Diameter (mm)*: 24. *Collector*: Dan Minchin. *Voucher Details*: National Herbarium, Dublin (DBN). *Reference*: This paper.

PLATE 1. Pecan Nut (*Carya illinoinensis*) endocarp stranded on Long Strand, Castlefreke, County Cork (8 December 1998).

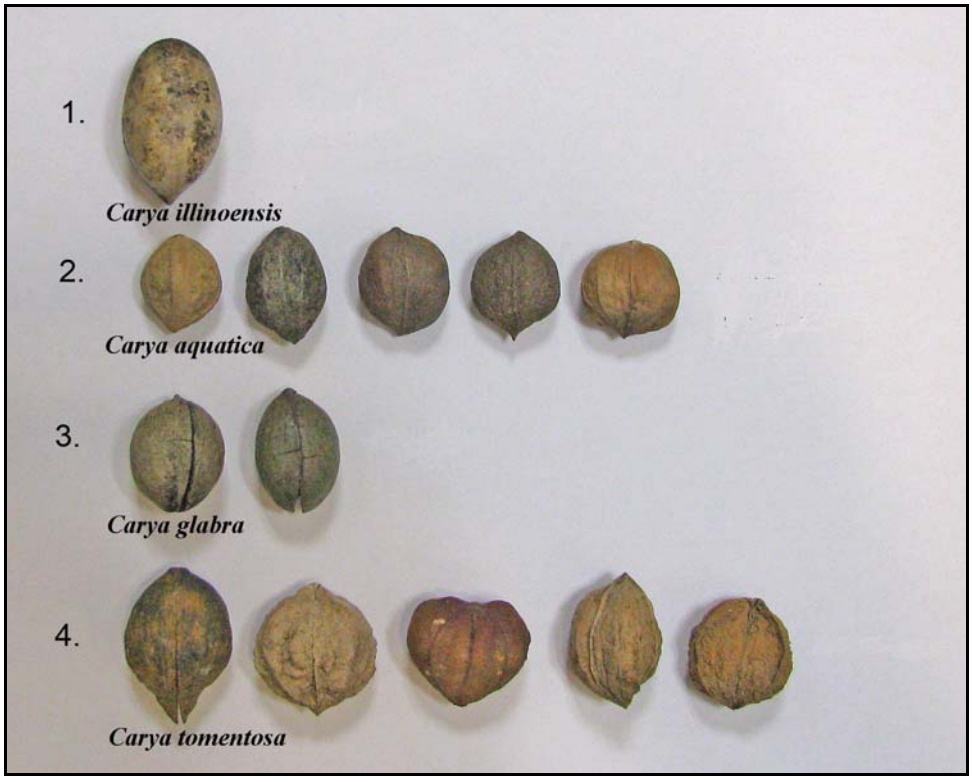


PLATE 2. *Carya* drift endocarps collected from the east coast of Florida, U.S.A. (Courtesy of Ed Perry).

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

RECORDS AND A CHECKLIST OF CHIRONOMIDAE (INSECTA: DIPTERA) IN COUNTY LOUTH AND AN UPDATED SUMMARY OF SPECIES DISTRIBUTION IN IRELAND

D. A. Murray
Emeritus Associate Professor, Freshwater Biodiversity, Ecology and Fisheries Research Group, School of Biology and Environmental Science, University College Dublin, Belfield, Dublin 4, Ireland.
e-mail: <declan.murray@ucd.ie>
(address for correspondence: *Meadesbrook, Ashbourne, Co. Meath, A84 K727, Ireland*)

Abstract

Thirty four species of Chironomidae are documented for County Louth, thirty-one as first records in the county of which sixteen are additional species in Hydrometric Area 6. The status of previous records from the county is reviewed and a checklist of the 42 species currently on record for County Louth is given. Updated summary data of total numbers of species-level taxa of Chironomidae in all Counties and Hydrometric Areas of Ireland are given from records in the present work and from data published since January 2018.
Key words: Chironomidae, distribution, Ireland, County Louth, Hydrometric Area 6.

Introduction

A comparatively low number of 22 species of Chironomidae (Insecta, Diptera) was noted in County Louth by Murray *et al.* (2018) who provided data on the number of species-level taxa documented from the 32 administrative counties on the island of Ireland up to December 2017. Since juvenile stages of chironomids are limited to aquatic habitats, the distribution data of Chironomidae in Ireland has recently been documented by Hydrometric Area (i.e. river catchment area) as well as by County. There are 40 defined Hydrometric Areas on the island of Ireland (see <www.epa.ie> for details) and Murray *et al.* (*loc. cit*.) noted that 63 species were on record in Hydrometric Area 6 (HA 6), comprised of river catchments draining the greater part of the landmass of County Louth, as well as parts of Counties Armagh and Down (in Northern Ireland) and Meath and Monaghan. Compilation of distribution information since December 2017, from ongoing fieldwork and review of prior collections of chironomids, gave additional distribution records (Murray, 2018, 2019; Murray and Langton, 2018; Murray and O'Connor, 2018). However, records from County Louth remained low and in actual fact are less than the 22 species documented for the county by Murray *et al*. (2013, 2014, 2015, 2018) since some records at Lough Mentrim (also in HA 6) had been mistakenly included for the inventory of the chironomid fauna of County Louth instead of County Meath. Lough Mentrim is situated

approximately 1000m from the administrative boundary between Counties Louth and Meath. Thus, removal of the fourteen species records at Lough Mentrim, previously attributed to County Louth, gives a revised lesser total of just eight species. To address this shortcoming, collections of Chironomidae were made at five locations in County Louth in September 2018 in an attempt to provide additional and new records for the County and HA 6. An account of 34 species identified from those collections, of which 16 are additional records for HA 6, is given here with a checklist of the 42 species now positively on record in the county. Furthermore, the opportunity is taken here to update the summary data provided by Murray *et al*. (2018) of total numbers of species-level taxa of Chironomidae on record in the Counties and Hydrometric Areas of Ireland incorporating records from the present work and those reported since December 2017 by Langton and Ruse (2018), Murray (2018, 2019), Murray and Langton (2018) and Murray and O'Connor (2018).

Abbreviations

The following abbreviations are used in the text: BPH - Brian P. Hayes; DAM - D. A. Murray; det.- determined by; EPA - Environmental Protection Agency; *et al*. - et alia; leg. - collected by; Pe - pupal exuviae; HA - Hydrometric Area; ♂ - adult male.

Methods

Collections of Chironomidae were made on 11 September 2018 at five locations in HA 6 in County Louth - at two sites on the River Dee, one on the River Glyde, one at the Rathescar Sanctuary, near Dunleer and one from a small animal drinking trough in the townland of Anagassan. Pupal exuviae were obtained from the Rivers Dee and Glyde by drift nets set in place for periods of one to two hours. Collections from a pond at Rathescar and from the animal drinking trough were made by skimming the water surface with a fine mesh net following techniques of Wilson and Ruse (2005). All specimens were preserved in the field in 75% alcohol. Identifications of exuviae are based on Langton and Visser (2003). Some "drowned" partially emerged adult male Chironomidae as well as adults collected by aerial net, were identified mostly from Langton and Pinder (2007) and from Hirvenoja (1973) for species of *Cricotopus* (Orthocladiinae).

Sampling sites

Collections of Chironomidae were made at five sites in County Louth in Hydrometric Area 6 on 11 September 2018. Locality details of these sites, with six-figure Irish Grid Reference number (IGR) are as follows:

Site 1: River Dee, bridge on road N33, 1km east of Ardee, IGR N973910.

Site 2: River Dee, Drumcar Bridge, IGR O065910.

Site 3: River Glyde, Drumleck, IGR O345957.
Site 4: Pond at the Rathescar Sanctuary, Dunleer, IGR O027870.
Site 5: Animal drinking trough, 1km west of Anagassan, IGR O081939.

Results

Thirty-four species were identified from the collections in County Louth on 11 September 2018. These are discussed alphabetically by genus in their respective subfamilies in the taxonomic sequence adopted in Murray *et al.* (2018).

Subfamily TANYPODINAE

***Conchapelopia* (*Conchapelopia*) *melanops* (Meigen, 1818) New to County Louth**

River Glyde, Drumleck, Pe.

This is the first record from County Louth but the species was previously recorded in HA 6 by Hayes (1991), in July 1983, from the River Dee at Drumconrath (County Meath) and in May 2007 at Lough Naglack, Carrickmacross, County Monaghan. It is also known from the adjacent HA 3 in County Armagh and in HA 7 in County Cavan at Loughs Acurry and Drumkeery, near Baileborough and at several locations along the River Boyne in County Meath (Murray *et al.*, 2013).

***Macropelopia* (*Macropelopia*) *nebulosa* (Meigen, 1804) New to County Louth**

River Glyde, Drumleck, Pe.

There are no previous records of *Macropelopia nebulosa* in County Louth but the species is known in HA 6 since 1983 from the River Dee at Drumconrath (Hayes, 1991) and more recently in 2007 from Lough Naglack, County Monaghan (Murray *et al*., 2013, 2018).

***Procladius* (*Holotanypus*) *choreus* (Meigen, 1804) Confirmed for County Louth**

Rathescar Pond, Dunleer, Pe.

This record at Rathescar confirms the occurrence in County Louth of *Procladius choreus*, a species that is commonly distributed in Ireland. It is already known from HA 6 at Lough Mentrim in County Meath, a record that was listed in error for County Louth in Murray *et al*. (2014, 2018). It has been recorded from the adjacent HA 7 at two locations on the River Blackwater in County Cavan (Murray *et al*., 2013).

***Psectrotanypus varius* (Fabricius, 1787) New to County Louth and HA 6**

Rathescar Pond, Dunleer, Pe.

This is the first record of the species from both HA 6 and County Louth but *Psectrotanypus varius* is known in the adjoining HA 7 in the River Boyne - Blackwater catchment from six locations in County Meath and two locations in County Cavan (Murray *et al*., 2013).

Subfamily ORTHOCLADIINAE

***Brillia longifurca* Kieffer, 1921 New to County Louth and HA 6**

River Glyde, Drumleck, ♂, Pe.

Records of *Brillia longifurca* exist from 68 locations in 18 HAs in Ireland and although this is the first record of the species in County Louth and HA 6, *B. longifurca* is known from five locations in the adjoining HA 7 in County Meath (Murray *et al*., 2014, 2018).

***Cricotopus* (*Cricotopus*) *albiforceps* (Kieffer, 1916) New to County Louth and HA 6**

Rathescar Pond, ♂, Pe.

This is the first record of the species in County Louth and HA 6 (it was listed in error as being on record in County Louth in Murray *et al.* (2018, p. 85)). With this new record from Rathescar the species is now known from 18 HAs, including three locations on the River Boyne in adjoining County Meath in HA 7 (Murray *et al.*, 2014).

***Cricotopus* (*C.*) *curtus* Hirvenoja, 1973 New to County Louth and HA 6**

River Glyde, Drumleck, Pe.

Cricotopus (*C.*) *curtus* has a widespread dstribution in Ireland and is known from 22 of the 40 HAs in the country (Murray *et al*., 2018). While the species is already on record in HA 7, from the River Boyne at Stackallen (Murray *et al*., 2014), this is the first record from HA 6 and County Louth.

***Cricotopus* (*Isocladius*) *sylvestris* (Fabricius, 1794) New to County Louth**

Rathescar pond, Dunleer, ♂, Pe and **River Dee**, N33 road bridge, Pe.

This widely distributed species is known from 28 of the 40 HAs of Ireland. Although this is the first documentation of the species in County Louth, it is already on record in HA 6 in County Monaghan and at several locations in HA 7 in Counties Cavan and Meath (Murray *et al*., 2014, 2018).

***Eukiefferiella claripennis* (Lundbeck, 1898) New to County Louth**

River Dee, N33 road bridge, Pe.

While this is the first record of the species from County Louth, *Eukiefferiella claripennis* was previously documented from HA 6 in July 1983 (Hayes, 1991) from the section of the River Dee that flows through County Meath at Drumconrath (Murray *et. al*., 2014). The species has a widespread distribution in Ireland and is known from 27 of 40 HAs.

***Eukiefferiella ilkleyensis* (Edwards, 1929) New to County Louth**

River Dee, N33 road bridge, Pe.

This widely distributed species is already on record in HA 6 from the River Dee (Hayes, 1991) in County Meath as well as from 15 other locations in HAs 7 and 8 in County Meath (Murray *et al*., 2014).

***Nanocladius* (*Nanaocladius*) *rectinervis* (Kieffer, 1911) New to County Louth**

River Glyde, Drumleck, Pe.

This is a widely distributed species in Ireland but the record at Drumleck is the first of the species in County Louth. It has been previously recorded in HA6 from the River Dee at Drumconrath in County Meath and is also on record from 12 other locations in HA 7 in County Meath (Murray *et al.*, 2014).

***Orthocladius* (*Eudactylocladius*) *fuscimanus* (Kieffer, 1908) New to County Louth and HA 6**

River Dee, N33 road bridge, Pe.

Larvae of *Orthocladius* (*E.*) *fuscimanus* are mostly characteristic of hygropetric habitats of lakes, rivers and artificial ponds. While this is the first record of the species from County Louth and HA 6, it is known from 34 locations in Ireland in 15 HAs, including three locations in the adjacent HA 7 in County Meath (Murray *et al.*, 2014).

***Orthocladius* (*Orthocladius*) *glabripennis* (Goetghebuer, 1921) New to County Louth and HA6**

River Glyde, Drumleck, Pe.

There are currently few records of this species in Ireland and apart from a recent record from County Wexford (Murray, 2017), other records of *Orthocladius* (*O.*) *glabripennis* are thus far in north, west and central counties (Murray *et al*., 2018).

***Orthocladius* (*O.*) *oblidens* (Walker, 1856) New to County Louth**

River Dee, Drumcar Bridge, Pe.

This species has been widely recorded in Ireland with records from 137 locations in 29 HAs (Murray *et al.*, 2018). While this is the first record of *Orthocladius* (*O.*) *oblidens* from County Louth, the species is already on record in HA 6 from the section of the River Dee that flows through County Meath at Drumconrath (Hayes, 1991). It is also known from ten locations in HA 7 in the River Boyne catchment in Counties Kildare and Meath (Murray *et al*., 2014).

***Orthocladius* (*O.*) *rhyacobius* Kieffer, 1911 New to County Louth and HA 6**

River Dee, N33 road bridge, Pe.

This is the first record of *Orthocladius* (*O.*) *rhyacobius* in County Louth and HA 6. The species was previously documented by Murray *et al.* (2014) as *O.* (*O.*) *obumbratus* in HA 7 in County Meath from identifications of pupal exuviae based on Langton (1991) and Langton and Visser (2003). However, pupal exuviae determined as *O. obumbratus* from Langton and Visser (2003) are now recognised as *O. rhyacobius* (Murray *et al.*, 2018).

***Orthocladius (O.) rubicundus* (Meigen, 1818) New to County Louth and HA 6**

River Glyde, Drumleck, Pe.

Although this is a widely distributed species in Ireland that is documented from 174 locations (Murray *et al*., 2018), until now there have been no records from HA 6 or County Louth. However, it is known from 19 sites in HA 7 in the adjacent County Meath (Murray *et al*., 2014).

***Parametriocnemus stylatus* (Spärck, 1923) New to County Louth**

River Glyde, Drumleck, Pe.

Parametriocnemus stylatus is widely distributed in Ireland with records from 188 locations (Murray *et al*., 2018). The record from the River Glyde constitutes the first for County Louth but is already on record in HA 6 from the River Dee, at Drumconrath, County Meath and from 24 locations in HA 7 (Murray *et al*., 2014).

***Rheocricotopus* (*Psilocricotopus*) *chalybeatus chalybeatus* (Edwards, 1929) New to County Louth and HA 6**

River Glyde, Drumleck, Pe.

Although this species is widely distributed in Ireland, with records from over 74 locations in 21 hydrometric areas (Murray *et al*., 2018), this is the first record from HA 6 and County Louth. It is already known from eight sites in the adjoining HA 7 in County Meath (Murray *et al*., 2014).

***Rheocricotopus* (*P.*) *glabricollis* (Meigen, 1830) New to County Louth and HA 6**

River Dee, Drumcar Bridge, Pe.

There are few records of this species in Ireland, one each in Counties Meath and Wexford in the east and southeast of the country and in the southwest of the country, two in County Cork and three in County Kerry (Murray *et al*., 2014, 2018). The new record from County Louth is not unexpected since the species was recently documented from the River Boyne in the adjacent HA 7 at Newgrange (Murray, 2016).

***Synorthocladius semivirens* (Kieffer, 1909) New to County Louth**

River Glyde, Drumleck, Pe.

Synorthocladius semivirens is widely distributed in Ireland, with records from over 400 locations. Surprisingly, this is the first record of the species in County Louth but it is already on record from HA 6 in County Monaghan and there are 15 records from HA 7 in counties Cavan and Meath (Murray *et al*., 2018). Records now exist from 28 of the 32 counties and from 37 of the 40 HAs.

***Tvetenia calvescens* (Edwards, 1929) New to County Louth**

River Dee, N33 road bridge, Pe.

This species is widespread in Ireland with previous records from 268 locations in 33 HAs and 28 counties (Murray *et al*., 2018). While this is the first record of the species in County Louth, it is already on record in HA 6 from the River Dee at Drumconrath, County Meath (Hayes, 1991) and from 21 locations in HA 7 (Murray *et al*., 2014).

***Tvetenia verralli* (Edwards, 1929) New to County Louth**

River Glyde, Drumleck, Pe.

Tvetenia veralli is known from 121 locations in in 29 HAs and 23 counties in Ireland and thus is not as widespread as *T. calvescens*. It has not previously been recorded in County Louth but is known from HA 6 from the River Dee at Drumconrath, County Meath (Hayes, 1991; Murray *et al*., 2014).

Subfamily CHIRONOMINAE

Tribe Chironomini

***Chironomus* (*Chironomus*) *plumosus* (Linnaeus, 1758) New to County Louth**

Rathescar pond, Dunleer, Pe.

Chironomus (*C.*) *plumosus* is widespread in Ireland with records from 68 locations (Murray *et al*., 2018). Its larvae are characteristic of organically enriched lentic habitats. The record from the waterbody at Rathescar constitutes the first record from County Louth but it is already documented in HA 6 from a small lake at Camlough, County Armagh in Northern Ireland. It is also known from a number of locations in HA 7 in County Meath (Murray *et al.*, 2015).

***Chironomus* (*C.*) *riparius* Meigen, 1804 New to County Louth and HA 6**

Animal drinking trough, Anagassan, Pe.

Larvae of this species are typical of smaller waterbodies such as ponds and rain-filled containers and garden tanks The record at Anagassan is the first of the species from County Louth and HA 6. It is known from three locations in the adjacent HA 7 in County Meath, including a record also from an animal drinking trough (Murray *et al.*, 2015).

***Cladopelma viridulum* (Linnaeus, 1767) Confirmed for County Louth**

Rathescar pond, Dunleer, Pe.

A record of *Cladopelma viridulum* from Lough Mentrim in HA 6, that lies just 1km from the Meath/Louth administrative boundary, was mistakenly assigned to County Louth rather than County Meath in Murray *et al*. (2016, 2018). This record from Rathescar is the first confirmed record of the species in County Louth.

***Phaenopsectra flavipes* (Meigen, 1818) New to County Louth and HA6**

River Glyde, Drumleck, Pe.

This species is widespread in Ireland with records from 74 locations throughout the country. While the record from the River Glyde constitutes the first from County Louth and HA 6, the species is known from four locations in the adjacent HA 7 on the River Boyne in County Meath where it was reported as *Lenzia flavipes* (Meigen) in August 1968 (Murray, 1972, 2016; Murray *et al.*, 2015).

***Polypedilum* (*Pentapedilum*) *sordens* (van der Wulp, 1874) New to County Louth**
River Glyde, Drumleck, Pe.

This is a widely distributed species in Ireland with records from 117 locations. This is the first record from County Louth but the species is already known in HA 6 from collections at Lough Mentrim, County Meath (Murray, 2015; Murray *et al*., 2015, 2018).

***Polypedilum* (*Uresipedilum*) *convictum* (Walker, 1856) New to County Louth**
River Dee, N33 road bridge, Ardee, Pe.

There are records from over 110 locations in Ireland but none, until now, from County Louth, although it is known from HA 6 in County Meath (Murray *et al.*, 2015).

***Polypedilum* (*U.*) *cultellatum* Goetghebuer, 1931 New to County Louth and HA 6**
River Dee, N33 road bridge, Ardee, Pe.

This is the first record of *Polypedilum* (*U.*) *cultellatum* from County Louth and HA 6 although the species is known from ten locations in the adjoining HA 7 in County Meath (Murray *et al.*, 2015, 2018).

Tribe Tanytarsini

***Paratanytarsus dissimilis* (Johannsen, 1905) New to County Louth**
River Dee, N33 road bridge, Ardee, Pe.

This is the first record of the species in County Louth but it is already known in HA 6 from Lough Moynalty, Carrickmacross, County Monaghan and at several locations in the adjoining HA 7 in County Meath (Murray *et al*., 2015).

***Tanytarsus brundini* Lindeberg, 1963 New to County Louth and HA 6**
River Glyde, Drumleck, Pe.

This common species has a widespread distribution in Ireland with records from 152 locations (Murray *et al*., 2018) but it is documented here for the first time in County Louth and HA 6. It is already known from 16 locations in the adjoining HA 7 in the River Boyne-Blackwater catchment in County Meath (Murray, 2016; Murray *et al.*, 2015).

***Tanytarsus ejuncidus* (Walker, 1856) New to County Louth and HA6**
River Dee, Drumcar Bridge, Pe.

While this is the first record for County Louth and HA6, *Tanytarsus ejuncidus* is known from three locations in the adjoining HA 7 on the River Boyne in County Meath (Murray *et al.*, 2015).

***Tanytarsus mendax* Kieffer, 1925 Confirmed for County Louth**
Rathescar pond, Dunleer, Pe.

Records of *Tanytarsus mendax* in Ireland are almost exclusively from ponds and lakes. It is already on record from HA 6 at Lough Mentrim (erroneously listed under County Louth in

Murray *et al*. (2014, 2018)). This species is also known in the adjoining HAs 7 and 36 in Counties Cavan and Monaghan respectively (Murray *et al*., 2015, 2018)

***Virgatanytarsus triangularis* (Goetghebuer, 1928) New to County Louth and HA6**

River Dee, N33 road bridge, Ardee, ♂, Pe.

River Glyde, Drumleck, Pe.

These are the first records of *Virgatanytarsus triangularis* from County Louth and HA 6. The species is known from the adjoining Counties Cavan and Meath in HAs 7 and 8 respectively (Murray *et al.*, 2015, 2018).

Discussion

The species of Chironomidae recorded in County Louth belong to the Subfamilies Tanypodinae, Orthocladiinae and Chironominae but there are no records to date of species in the Subfamilies Buchonomyiinae, Diamesinae, Prodiamesinae, Podonominae or Telmatogetoninae. A total of twenty-two (22) species were previously documented in County Louth, and 63 in HA 6 (Murray *et al*., 2018) but, as indicated above, 14 of those species had been mistakenly allocated to County Louth due to the inclusion of records from Lough Mentrim in County Meath. Thus, in reality, only eight species were known from County Louth prior to the present study. The total number of species known in HA 6 (63) remained unchanged since Lough Mentrim lies in HA 6. The collections from 2018 yielded records of 34 species, including 31 as first records for the County and three, *Procladius choreus*, *Cladopelma viridulum* and *Tanytarsus mendax*, that were also previously reported from L. Mentrim. Combined with the other eight species known to occur, a revised total of 42 species are now on record in County Louth. The additional 16 species documented for the first time in HA 6 gives an updated total of 79 species for this catchment. It would be reasonable to expect records of species in the subfamilies Diamesinae, Prodiamesinae, and perhaps of the marine coastal dwelling Telmatogetoniinae, in future collections in County Louth. A list of the species currently known from County Louth is given in Appendix I.

Update of species representation in Counties and Hydrometric Areas

Since the compilation of the list of Chironomidae by Murray *et al.* (2018) a further two species have been confirmed as new for Ireland, both in County Derry in HA 3. *Nanocladius distinctus* (Malloch, 1915), Subfamily Orthocladiinae, was added by Langton and Ruse (2018) while a record of *Micropsectra recurvata* (Goetghebuer, 1928), Subfamily Chironominae (Tribe Tanytarsini), was added by Murray and Langton (2018) who also noted an earlier, unconfirmed record, from HA 33 in County Mayo. These records, together with new County and Hydrometric Area distribution records acquired since 2017 (Murray, 2018, 2019; Murray and

Langton, 2018; Murray and O'Connor, 2018), result in changes to the summary data given by Murray *et al*. (2018). The amended and updated summary of numbers of species-level taxa of Chironomidae on record (as of September 2019) in the Counties and Hydrometric Areas of Ireland is presented in Tables 1 and 2, following the same format of Tables 2 and 3 in Murray *et al.* (*loc. cit.*). Increases in species representation are noted in 15 Counties: Carlow, Cork, Derry, Donegal, Dublin, Galway, Kerry, Laois, Louth, Meath, Offaly, Roscommon, Waterford, Wexford and Wicklow. Similarly, the new distribution data shows increases for 19 Hydrometric Areas: 3, 8, 9, 10,12, 17, 19, 20, 21, 25, 26, 27, 29, 31, 32, 33, 35, 37 and 38.

Faunal inventories and checklists are subject to frequent amendment and updating as a result of taxonomic change, reviews of existing material and ongoing fieldwork. There are currently 522 named species and 542 species level taxa (i.e. including 14 taxa recognized by their distinct pupal exuviae and six known, but as yet undescribed, species) known from the island of Ireland.

Acknowledgement

The assistance of W. A. Murray during fieldwork in County Louth and for her constructive comments and proof-reading of text is gratefully acknowledged.

References

Hayes, B. P. (1991) *Studies on the Chironomidae (Diptera: Insecta) of Irish rivers, based on collections of pupal exuviae*. Ph.D. thesis. Department of Zoology, University College Dublin.

Hirvenoja, M. (1973) Revision der Gattung Cricotopus van der Wulp und ihrer Verwandten (Diptera, Chironomidae). *Annales zoologici fennici* **10**: 1-363.

Langton, P. H. (1991) *A key to the pual exuviae of West Palaearctic Chironomidae.* Privately published by the author.

Langton, P. H. and Pinder, L. C. V. (2007) Keys to the adult male Chironomidae of Britain and Ireland. *Freshwater Biological Association Scientific Publication* **Number 64**: Volume 1: 1-239. Volume 2: 1-168.

Langton P. H. and Ruse, L. P. (2018) *Nanocladius* (*Nanocladius*) *distinctus* (Malloch, 1915) (Diptera, Chironomidae) new to Britain and Ireland. *Dipterists Digest* (*Second Series*) **25**: 17-19.

Langton, P. H. and Visser, H. (2003) *Chironomidae exuviae - A key to pupal exuviae of the West Palaearctic Region*. Interactive System for the European Limnofauna Biodiversity Centre of ETI, UNESCO Publishing, Paris.

Murray, D. A. (1972) A list of the Chironomidae (Diptera) known to occur in Ireland with notes on their distribution. *Proceedings of the Royal Irish Academy* **72B**: 275-293.

Murray, D. A. (2015) The Chironomidae (Diptera) of Ireland. Data set. National Biodiversity Data Centre Waterford, 11 March 2015. <http://maps.biodiversityireland.ie/#/DataSet/199>

Murray, D. A. (2016) An annotated inventory of the Chironomidae (Insecta: Diptera) of County Meath, Ireland. *Bulletin of the Irish Biogeographical Society* **40**: 18-42.

Murray, D. A. (2018) Further distribution records of Chironomidae (Insecta: Diptera) in Ireland from past collections. *Bulletin of the Irish Biogeographical Society* **42**: 58-74.

Murray, D. A. (2019) New County and Hydrometric Area records of Chironomidae (Insecta: Diptera) in Ireland from recent and past collections. *Bulletin of the Irish Biogeographical Society* **43**: 19-27.

Murray, D. A. and Langton, P. H. (2018) Doubt and certainty in records of *Micropsectra recurvata* Goetghebuer (Insecta: Diptera: Chironomidae) in Ireland. *Bulletin of the Irish Biogeographical Society* **42**: 155-158.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2013) Distribution records of Irish Chironomidae (Diptera): Part 1 – Buchonomyiinae: Podonominae, Tanypodinae, Telmatogetoninae, Diamesinae and Prodiamesinae. *Bulletin of the Irish Biogeographical Society* **37**: 208-336.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2014) Distribution records of Irish Chironomidae (Diptera): Part 2 – Orthocladiinae. *Bulletin of the Irish Biogeographical Society* **38**: 61-246.

Murray, D. A., Langton, P. H., O'Connor, J. P. and Ashe. P. (2015) Distribution records of Irish Chironomidae (Diptera): Part 3 – Chironominae. *Bulletin of the Irish Biogeographical Society* **39**: 7-192.

Murray, D. A. and O'Connor, J. P. (2018). Distribution records of Chironomidae (Insecta: Diptera) in Ireland from recent collections. *Bulletin of the Irish Biogeographical Society* **42**: 34-44.

Murray, D. A., O'Connor, J. P. and Ashe P. (2018) Chironomidae (Diptera) of Ireland - a review, checklist and their distribution in Europe. *Occasional Publication of the Irish Biogeographical Society* Number **12**. Published by the Irish Biogeographical Society in association with University College Dublin and the Environmental Protection Agency. 404 pp.

Wilson, R. S. and Ruse, L. P. (2005) A guide to the identification of genera of chironomid pupal exuviae occurring in Britain and Ireland (including common genera from northern Europe) and their use in monitoring lotic and lentic waters. *Freshwater Biological Association, Special Publication* **13**: 1-176.

TABLE 1. Number of species-level taxa of Chironomidae by Province and County in Ireland (including Rathlin Island and Clare Island). Total numbers are given for each Province. Numbers in normal font indicate the status in December 2017 (from Table 2 in Murray *et al*., 2018), numbers in **bold** indicate status in September 2019.

Province	County	Species	Province	County	Species
Ulster	Antrim	178	**Leinster**	Carlow	55 **56**
	Rathlin Island	61		Dublin	147 **152**
	Armagh	23		Kildare	69
	Derry	275 **277**		Kilkenny	66
	Down	75		Laois	56 **57**
	Fermanagh	165		Longford	62
	Tyrone	76		Louth	22 **42**
	GB-NI	350 **352**		Meath	199 **209**
	Cavan	168		Offaly	95 **98**
	Donegal	319 **323**		Westmeath	136
	Monaghan	84		Wexford	115 **116**
	ROI	352 **354**		Wicklow	184 **194**
	TOTAL	428 **432**		**TOTAL**	380 **382**
Munster	Clare	253	**Connacht**	Galway	301 **304**
	Cork	234 **236**		Leitrim	157
	Limerick	80		Mayo	347
	Kerry	317 **318**		Clare Island	133
	Tipperary	112		Roscommon	175 **182**
	Waterford	95 **96**		Sligo	148
	TOTAL	415		**TOTAL**	436 **437**

TABLE 2. Number of species of Chironomidae in the forty Hydrometric Areas (HA) of Ireland with total numbers for each of the eight River Basin Districts (RBD). Numbers in normal font indicate the status in December 2017 (from Table 3 in Murray *et al*., 2018), numbers in **bold** indicate status in September 2019.

RBD	HA	Species	RBD	HA	Species
NW RBD	HA 1	143	**SW RBD**	HA 18	106
	HA 2	92		HA 19	114 **115**
	HA 36	232		HA 20	162 **163**
	HA 37	130 **132**		HA 21	168 **169**
	HA 38	258 **268**		HA 22	284
	HA 39	168		Total	364
	HA 40	61	**SH RBD**	HA 23	53
	Total	372 **374**		HA 24	40
NB RBD	HA 3	282 **284**		HA 25	229 **232**
	HA 6	63 **79**		HA 26	233 **236**
	Total	298 **303**		HA 27	174 **177**
NE RBD	HA 4	102		HA 28	122
	HA 5	66		Total	350 **351**
	Total	**131**	**W RBD**	HA 29	88 **90**
E RBD	HA 7	228		HA 30	235
	HA 8	85 **86**		HA 31	151 **152**
	HA 9	187 **192**		HA 32	285 **286**
	HA 10	161 **170**		HA 33	180 **181**
	Total	351 **352**		HA 34	180
SE RBD	HA 11	32		HA 35	188 **189**
	HA 12	109 **110**		Total	410 **411**
	HA 13	30			
	HA 14	2 **3**			
	HA 15	90			
	HA 16	79			
	HA 17	44 **45**			
	Total	207			

[NW – North Western; NB – Neagh Bann; NE – North Eastern; E – Eastern; SE – South Eastern; SW – South Western; SH – Shannon; W – Western].

APPENDIX. Checklist of Chironomidae of County Louth, 2019. Records from collections in September 2018 are indicated by a plus symbol (+); new records for Hydrometric Area 6 are indicated by an asterisk (*). All species are from HA 6 except one (indicated $), from HA 7.

Subfamily TANYPODINAE
+*Conchapelopia melanops* (Meigen, 1818)
Krenopelopia nigropunctata (Staeger, 1839)
+*Macropelopia nebulosa* (Meigen, 1804)
+*Procladius* (*Holotanypus*) *choreus* (Meigen, 1804)
+**Psectrotanypus varius* (Fabricius, 1787)
Subfamily ORTHOCLADIINAE
+**Brillia longifurca* Kieffer, 1921
+**Cricotopus* (*Cricotopus*) *albiforceps* (Kieffer, 1916)
+**Cricotopus* (*C.*) *curtus* Hirvenoja, 1973
+*Cricotopus* (*Isocladius*) *sylvestris* (Fabricius, 1794)
+*Eukiefferiella claripennis* (Lundbeck, 1898)
+*Eukiefferiella ilkleyensis* (Edwards, 1929)
Halocladius (*Halocladius*) *fucicola* (Edwards, 1926)
Halocladius (*H.*) *variabilis* (Stæger, 1839)
Limnophyes minimus (Meigen, 1818)
+*Nanocladius* (*Nanocladius*) *rectinervis* (Kieffer, 1911)
+**Orthocladius* (*Eudactylocladius*) *fuscimanus* (Kieffer, 1908)
+**Orthocladius* (*Orthocladius*) *glabripennis* (Goetghebuer, 1921)
+*Orthocladius* (O.) *oblidens* (Walker, 1856)
+**Orthocladius* (O.) *rhyacobius* Kieffer, 1911
+**Orthocladius* (*O.*) *rubicundus* (Meigen, 1818)
+*Parametriocnemus stylatus* (Spärck, 1923)
Paraphaenocladius impensus (Walker, 1856)
Pseudorthocladius (*Pseudorthocladius*) *curtistylus* (Goetghebuer, 1921)
+**Rheocricotopus* (*Psilocricotopus*) *chalybeatus* (Edwards, 1929)
+**Rheocricotopus* (*P.*) *glabricollis* (Meigen, 1830)
+*Synorthocladius semivirens* (Kieffer, 1909)
+*Tvetenia calvescens* (Edwards, 1929)
+*Tvetenia verralli* (Edwards, 1929)
Subfamily CHIRONOMINAE
Tribe Chironomini
Chironomus (*Chironomus*) *aprilinus* Meigen, 1818
+*Chironomus* (*C.*) *plumosus* (Linnaeus, 1758)
+**Chironomus* (*C.*) *riparius* Meigen, 1804
+*Cladopelma viridulum* (Linnaeus, 1767)
+**Phaenopsectra flavipes* (Meigen, 1818)

APPENDIX (continued)
+*Polypedilum* (*Pentapedilum*) *sordens* (van der Wulp, 1874)
+*Polypedilum* (*Uresipedilum*) *convictum* (Walker, 1856)
+**Polypedilum* (*U.*) *cultellatum* Goetghebuer, 1931
Tribe Tanytarsini
$Micropsectra pallidula (Meigen, 1830)
+*Paratanytarsus dissimilis* (Johannsen, 1905)
+**Tanytarsus brundini* Lindeberg, 1963
+**Tanytarsus ejuncidus* (Walker, 1856)
+*Tanytarsus mendax* Kieffer, 1925
+**Virgatanytarsus triangularis* (Goetghebuer, 1928)

Distribution details of existing species records are given in Murray *et al*. (2013, 2014, 2015).

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

NEW CADDISFLY (TRICHOPTERA) DATA FROM IRELAND INCLUDING RECORDS FOR *HYDROPTILA LOTENSIS* MOSELY, 1930 AND *HYDROPTILA VECTIS* CURTIS, 1834

J. P. O'Connor and M. A. O'Connor
c/o National Museum of Ireland – Natural History, Merrion Street, Dublin 2, Ireland.
e-mail: <joconnor@museum.ie>

Abstract

Since the last review by O'Connor and O'Connor (2018), three species of caddisfly (Trichoptera) have been added to the Irish fauna (*Hydroptila lotensis* Mosely, 1930, *H. vectis* Curtis, 1834 and *Oxyethira mirabilis* Morton, 1904) while *Hydropsyche fulvipes* (Curtis, 1834) was confirmed as an Irish species. Altogether, 156 species are now known from the island. In addition, the first Irish adult of *Tricholeiochiton fagesii* (Guinard, 1879) was found. This species was previously only known in Ireland from larvae. New distributional data for many Irish caddisflies are provided along with updated maps for most of the listed species. New county records are noted.

Key words: Trichoptera, caddisflies, Ireland, new records, distribution, *Hydropsyche fulvipes* (Curtis, 1834), *Hydroptila lotensis* Mosely, 1930, *H. vectis* Curtis, 1834, *Oxyethira mirabilis* Morton, 1904, *Tricholeiochiton fagesii* (Guinard, 1879).

Introduction

Considerable progress has been achieved in mapping the distributions of the Irish caddisflies (Trichoptera) since O'Connor and O'Connor (2018). These new data are presented here. Four figure (1km) Irish grid references are given for each record and these can be easily located on the Discovery series of maps from the Ordnance Survey of Ireland. The shown distributions are mapped as 10km squares on longitude and latitude maps using DMAP with the more significant records indicated by arrows. Unless otherwise stated, specimens were identified by the senior author. The specimens were determined using Edington and Hildrew (1995), Wallace, Wallace and Philipson (2003), Malicky (2004), Barnard and Ross (2012), Waringer and Graf (2011), Salokannel and Mattila (2018) and Neu (2019). Voucher material of the rarer species has been retained in the O'Connor collection.

Since O'Connor and O'Connor (2018), another three species have been added to the Irish list (*Hydroptila lotensis* Mosely, 1930, *H. vectis* Curtis, 1834 and *Oxyethira mirabilis* Morton, 1904) while *Hydropsyche fulvipes* (Curtis, 1834) has been confirmed as an Irish species, bringing the total to 156 species for the island (O'Connor, 2019a, b; O'Connor and O'Connor, 2019; O'Connor, O'Connor and Gammell, 2019). In addition, the first Irish adult of

Tricholeiochiton fagesii (Guinard, 1879) was found. This species was previously only known in Ireland from larvae (O'Connor, 2019a).

"Addendum 2" and "Addendum 3"

"Addendum 2" which added records cited in O'Connor and O'Connor (2018) to the data set "Caddisflies (Trichoptera) of Ireland" <https://maps.biodiversityireland.ie/ Dataset/250> (O'Connor, 2018) was uploaded by the National Biodiversity Data Centre on 2 August 2019 (O'Connor, 2019c). *Inter alia* that Addendum includes Irish records of *Hagenella clathrata* (Kolenati, 1848) and also some records from John Brophy which are included in the present paper. "Addendum 3" with the other records in this paper, will be sent to the Centre for incorporation into the data set "Caddisflies (Trichoptera) of Ireland" early in 2020.

Distribution data

Unless otherwise stated, the distributional comments are from O'Connor (2015), O'Connor and O'Connor (2016, 2017, 2018).

RHYACOPHILIDAE

***Rhyacophila dorsalis* (Curtis, 1834)**

O'Connor and McNaughton (2019) record *Rhyacophila dorsalis* from Aghalum, Carnlough (D2518) and the Glenarm River (D3014), County Antrim.

CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 1 larva and 1♂ pupa 19 April 2019, collected in a tributary stream of the River Cabra, J. P. O'Connor & M. A. O'Connor.

CORK: Bere Island (V6944), larva 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

DONEGAL: Glenveagh National Park (C0019), 2♂♂2♀♀ 20-30 May 1998, 1♂ 12 August-2 September 1998, Malaise traps in *Betula*/acidophilous *Quercus* forest with tall-herb open areas along a river; Owencarrow River (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along river, all M. C. D. Speight.

DUBLIN: River Dodder, Rathfarnham (O1328), 2♂♂1♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

GALWAY: River Clare, Claregalway Bridge (M3733), 5 larvae 12 July 2011 and Crusheeny Bridge (M3932), 2 larvae 12 July 2011, Aquatic Services Unit, University College Cork (RPS, 2012).

KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 4 larvae 15 June 2010 and upstream of the bridge at Leixlip (O0035), 2 larvae 15 June 2010, collected and determined J. T. Brophy (Kildare County Council, 2012); River Liffey, Castletown Estate, Celbridge (N9733), 1♂1♀ 23 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: Glasha River, Glasha Crossroads (S2776), 10 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 4 larvae 10-11 March 2010; River Goul, Foulkscourt North (S2868), 1 larva 10-11 March 2010; River Goul, Foulkscourt South (S2666), 12 larvae, 10-11 March 2010, all collected M. Kelly-Quinn, determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).
LIMERICK: River Maigue, Glenma Townland (R5334), larva late April-early May 2018; River Maigue,Cherrygrove Bridge (R5238), larva late April-early May 2018; River Loobagh, Riversfield Bridge (R6326), larva late April-early May 2018 and Ardpatrick Stream (R6420), larva late April-early May 2018 (all Sweeney, 2018).
MAYO: Ballycroy National Park (F8607), 2♂♂3♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, M. C. D. Speight. Cloonlee River, Cloonconra (M2798), 2 larvae, September 2003; River Moy tributary, Rathbaun (G2510), 1 larva September 2003; River Moy tributary, Ardacarha (M2996), 1 larva September 2003 and River Moy, Ummoon (M2799), 1 larva September 2003, all M. J. Costello (Mayo County Council, 2007).
TIPPERARY: River Anner at Thornybridge (S2427), larva 19 August 2014; River Suir at Ballynaraha (S3123), larva 14 June 2014; River Suir at Kilshelin (S2823), larva 15 July 2014 and River Suir at Poulakerry (S2923), larva 19 August 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019). River Suir, Clonmel (S2122), 1♂1♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
WATERFORD: Glenary River at Kilmanahan (S1518), larva 5 August 2014 and River Glasha at Glenbridge (S3022), larva 15 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).
WEXFORD: Oaklands (Kelly's) Wood, stream (S7225), 1♂5♀♀ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Rhyacophila munda* McLachlan, 1862**

CAVAN: Clodrum (H2804), 1 larva 27 August 2017, stream near old watermill, H. Bothwell, det. H. Feeley from <http://records.biodiversityireland.ie/api/taxon-record/300236/image> (National Biodiversity Data Centre, 2019).
MAYO: River Aille, bridge north-west of Claureen (M1280), 10 larvae 19 June 2003, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).
TIPPERARY: River Anner at Thornybridge (S2427), larva 19 August 2014 and River Multeen at Ballygriffin (S0040), larva 23 May 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).
WATERFORD: Glencomeragh stream (S3222), larva 15 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

GLOSSOSOMATIDAE

***Agapetus fuscipes* Curtis, 1834 (Fig. 1)**

O'Connor and McNaughton (2019) record *Agapetus fuscipes* from Lough na Trosk, Garron Plateau (D2719), County Antrim.

CORK: Bere Island (V7143), larva 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

DUBLIN: River Dodder, Rathfarnham (O1328), 3♀♀ 16 June 2019, swept J. P. O'Connor & M. A. O'Connor.

GALWAY: Connemara National Park (L7157), 1♂4♀♀ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, (L7457), 1♂1♀ 20 July-10 August 1994, Malaise trap on cutover bog and *Salix* scrub near small stream, all M. C. D. Speight; Lissareaghaun Bog (M8519), 1 ♀ 3 June 2016, raised bog, K. G. M. Bond (National Biodiversity Data Centre, 2019).

KERRY: Owengarrif River, Killarney National Park (V9582), 1♂1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILDARE: Pollardstown Fen (N7715), 1♀ 27 June 2002, emergence trap, limnocrene tufa spring, J. A. Good.

This is the second locality for County Kildare (previous Louisa Bridge (N9936)).

KILKENNY: Glasha River, Glasha Crossroads (S2776), 22 larvae 10-11 March 2010; River Goul, Ballinafrase (S3173), 21 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 157 larvae 10-11 March 2010 and River Goul, Foulkscourt North (S2868), 126 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).

TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; Cappa stream at Ballynaraha (S3023), larva 3 May 2014 and River Suir at Ballynaraha (S3023), larva 27 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WEXFORD: Oaklands (Kelly's) Wood stream (S7225), 1♂1♀ 8 August 2019, swept, J. P. O'Connor & M. A. O'Connor; roadside stream near Oaklands (Kellys) Wood (S7225), 2♀♀ 15 August 2019, swept, M. A. O'Connor.

***Agapetus ochripes* Curtis, 1834 (Fig. 2)**

GALWAY: Connemara National Park (L7457), 1♂ 8-28 June 1994, Malaise trap on cutover bog and *Salix* scrub near small stream, M. C. D. Speight.

This is the second locality for County Galway (previous Dunkellin River/Rahasane Turlough (M4719)).

KERRY: Lough Leane, Killarney (V9486), 2♀♀ 26 June-6 July 1993, Malaise trap on Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 3♀♀ 23 June 2019 and 2♂♂ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.
KILKENNY: River Nore, Bennettsbridge (S5549), 1♂ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
LIMERICK: River Loobagh, Riversfield Bridge (R6326), larva late April-early May 2018 (Sweeney, 2018).
TIPPERARY: River Suir, Clonmel (S2122), 43♂♂21♀♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Glossosoma boltoni* Curtis, 1834 New to County Limerick (Fig. 3)**

CORK: Lackendarragh near the River Bride (W7189), 1♀ 31 December 2016, K. G. M. Bond. The previous latest flight date was the 26 October.
GALWAY: Connemara National Park (L7157), 1♀ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, (L7457), 1♂ 19 May-8 June 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, all M. C. D. Speight.
KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 5 larvae 21 June 2011, collected and determined J. T. Brophy (Kildare County Council, 2012).
LIMERICK: River Maigue, Creggane Bridge (R5327), larva late April-early May 2018 (Sweeney, 2018).
TIPPERARY: Multeen River at Ballygriffin (S0040), larva 17 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, Clonmel (S2122), 1♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
WATERFORD: Tramore (S5701), 1♀ 27 May 2017 and 1♂ 17 September 2018, 125w MV Robinson light-trap, T. Bryant.

***Glossosoma conformis* Neboiss, 1963 New to County Wexford (Fig. 4)**

WEXFORD: Maudlins Stream, New Ross (S7328), 4♀♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

HYDROPTILIDAE

***Agraylea multipunctata* Curtis, 1834**

O'Connor and McNaughton (2019) record *Agraylea multipunctata* from Kilgad (Riversdale) Lake (J1798), County Antrim.
KERRY: Lough Leane, Killarney (V9486), 4♂♂2♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

***Hydroptila angulata* Mosely, 1922 New to County Kilkenny (Fig. 5)**

DONEGAL: Glenveagh National Park (C0120), 1♂ 12 August-2 September 1998, Malaise trap in a mature acidophilous *Quercus* forest, M. C. D. Speight.

KERRY: Lough Leane, Killarney (V9486), 6♂♂ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight; Owengarrif River, Killarney National Park (V9582), 1♂ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.
KILKENNY: River Nore, Inistioge (S6337), 1♀ 15 August 2019, light trap, J. P. O'Connor & M. A. O'Connor.
MAYO: Ballycroy (Mayo) National Park (F8607), 1♀ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, M. C. D. Speight.

This is the second locality for County Mayo (previous Lough Conn (G2105)).

***Hydroptila cornuta* Mosley, 1922**

KERRY: Doolough, Killarney National Park (V9585), 1♂ 6-16 July 1993, 1♂ 25 August-5 September 1993, Malaise traps in old *Betula*/*Quercus* woods and swamp, strip of *Alnus*/*Salix* at the edge of the lake, M. C. D. Speight; Lough Leane, Killarney (V9486), 5♂♂ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.
KILKENNY: River Nore, Bennettsbridge (S5549), 1♂ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Hydroptila forcipata* (Eaton, 1873)**

DONEGAL: Glenveagh National Park (C0018), 10♂♂2♀♀ 10-30 June 1998, Malaise trap on blanket bog and cutover bog and 1♂ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog, 1♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along a river, M. C. D. Speight.
DUBLIN: River Dodder, Rathfarnham (O1328), 7♂♂8♀♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor; Dublin Zoo, Phoenix Park (O1235), 1♂ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

Previously taken on the river at Clonskeagh (O1730) by J. R. Harris in 1946 and 1947.

KERRY: Lough Leane, Killarney (V9486), 1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight; Gearnameen near the Gearham River, Killarney National Park (V8882), 1♂ 25 May 2017, Skinner trap, K. G. M. Bond; Owengarrif River, Killarney National Park (V9582), 49♂♂31♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.
KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 2♂♂2♀♀ 23 June 2019 and 1♂1♀ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.
KILKENNY: River Nore, Bennettsbridge (S5549), 2♀♀ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

TIPPERARY: River Suir, Clonmel (S2122), 1♂1♀11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Hydroptila lotensis* Mosely, 1930 New to County Kilkenny (Fig. 6)**

A species new to Ireland, *Hydroptila lotensis* (2♂♂1♀), was collected by M. A. O'Connor on the River Liffey at the Castletown Estate, Celbridge (N9733), County Kildare, on the 23 June 2019. Subsequently, 3♀♀ were taken at the same site on 30 June 2019 (O'Connor and O'Connor, 2019).

KILKENNY: River Nore, Inistioge (S6337), 2♂♂3♀♀ 15 August 2019, Heath light-trap situated beside a stream entering, the river and River Nore, Bennettsbridge (S5549), 3♂♂ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

The females were identified using Neu (2019).

***Hydroptila martini* Marshall, 1977 (Fig. 7)**

KERRY: Owengarrif River, Killarney National Park (V9582), 1♂2♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

This is the third record for County Kerry.

KILDARE: Pollardstown Fen (N7615), 1♂ 27 July 2002, emergence trap, artificial ponds, tufa ledge, (N7716), 2♀♀ 30 June 2003, emergence traps, tufa drains, 2♂♂7♀♀ 30 June 2003, emergence trap *Schoenus* tufa flush, J. A. Good.

Hydroptila martini is previously known from Pollardstown Fen (N7616, N7715).

***Hydroptila pulchricornis* Pictet, 1834**

KERRY: Lough Leane, Killarney (V9486), 128♂♂31♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

Previously, *Hydroptila pulchricornis* had only been taken in small numbers in Ireland.

***Hydroptila simulans* Mosely, 1920 New to Counties Donegal, Kildare and Wexford (Fig. 8)**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♂ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 10♂♂ 10 August 2019, (S5550), 9♂♂ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

WEXFORD: J. F. Kennedy Park, a stream flowing into the Duck Pond (S7218), 1♂ 30 July 2019, swept, J. P. O'Connor.

***Hydroptila sparsa* Mosely, 1920**

DUBLIN: River Dodder, Rathfarnham (O1328), 1♂ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor; River Liffey, St Catherine's Park (O0235), 3♂♂ 27 September 2018, swept, J. P.

O'Connor & M. A. O'Connor; Dublin Zoo, Phoenix Park (O1235), 2♀♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

Hydroptila sparsa is new to the River Dodder. The previous latest flight period was the 20 September.

KERRY: Lough Leane, Killarney (V9486), 1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 7♂♂5♀♀ 23 June 2019 and 1♂ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 25♂♂15♀♀ 10 August 2019, (S5550), 5♂♂1♀ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

MAYO: Ballycroy National Park (F8607), 1♂ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

TIPPERARY: River Suir, Clonmel (S2122), 6♂♂5♀♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

WEXFORD: River Maudlins, New Ross (S7328), 2♀♀ 8-9 August 2019, Heath light trap, J. P. O'Connor & M. A. O'Connor.

***Hydroptila tineoides* Dalman, 1819 New to County Dublin (Fig. 9)**

DONEGAL: Glenveagh National Park (C0221), 100♂♂15♀♀ 10-30 June 1998, 2♂♂2♀♀ 12 August-2 September 1998, Malaise traps on blanket bog/cut over blanket bog with pools near Lough Veagh (Beagh), (C0120), 1♂ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus* woodland, all M. C. D. Speight.

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♀ 27 May-11 June 2019, Rothamsted Insect Survey light-trap, per A. Riley.

There are several lakes in Dublin Zoo.

GALWAY: Connemara National Park (L7457), 1♂ 28 April-19 May 1994, 7♂♂1♀ 19 May-8 June 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

KERRY: Gearnameen near the Gearham River, Killarney National Park (V8882), 1♀ 25 May 2017, Skinner trap, K. G. M. Bond; Owengarrif River, Killarney National Park (V9582), 5♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

***Hydroptila valesiaca* Schmid, 1947**

KILDARE: Pollardstown Fen (N7615), 1♀ 27 June 2002, emergence trap, *Schoenus* tufa flush in Connolly's Field, 4♂♂ 27 July 2002, emergence traps, tufa ledges, artificial ponds, 1♂3♀♀ 30 June 2003, emergence trap, *Schoenus* tufa flush, (N7716), 2♂♂3♀♀, emergence trap, *Schoenus* tufa flush, J. A. Good.

Hydroptila valesiaca was previously known in County Kildare from 1♂ taken at Pollardstown Fen (N7616). The above records extend the known Irish flight period which is now 27 June-27 July, 30 August-11 September.

***Hydroptila vectis* Curtis, 1834 New to County Kildare (Fig. 10)**

Hydroptila vectis was added to the Irish list based on four males taken by Martin Speight in a Malaise Trap in Glenveagh National Park (C0018), County Donegal, in north-west Ireland (O'Connor, 2019a). The species was subsequently discovered to be abundant on the River Dodder (O1328), County Dublin (O'Connor and O'Connor, 2019).

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♂ 7 July 2019, (N9833), small stream, 1♂ 25 September 2019, all swept, J. P. O'Connor & M. A. O'Connor.

***Ithytrichia lamellaris* Eaton, 1873**

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 3♂♂1♀ 27 May-11 June 2019, Rothamsted Insect Survey light-trap, per A. Riley.

The adults may have flown from the nearby Viceregal Stream.

KILKENNY: River Nore, Bennettsbridge (S5549), 3♂♂6♀♀ 10 August 2019, (S5550), 1♂ 10 August 2019, all J. P. O'Connor & M. A. O'Connor.

TIPPERARY: River Suir, Clonmel (S2122), 2♂♂6♀♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Orthotrichia costalis* (Curtis, 1834) New to County Mayo (Fig. 11)**

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 18♂♂30♀♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

A female was previously taken at the Glen Pond, Phoenix Park (O0935), County Dublin.

MAYO: Carrigskeewaun near Lough Dooghtry (L7469), 1♀ 26 June 2018, light-trap, K. G. M. Bond.

WATERFORD: Belle Lake (S6605), 1♂1♀ 10 July 2019, light-trap in woodland, A. Walshe.

***Oxyethira falcata* Morton, 1893 (Fig. 12)**

DONEGAL: Glenveagh National Park (C0018), 2♀♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog, 5♂♂12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along a river, (C0323), 1♀ 12 August-2 September 1998, Malaise trap in humid, non-calcareous oligotrophic montane unimproved grassland and scattered *Betula*/*Quercus* along a river, all M. C. D. Speight.

These are the second and third localities in County Donegal and also the first specimens from that county since 1891 (O'Connor and O'Connor, 2018).

GALWAY: Connemara National Park (L7457), 1♂ 28 April-19 May 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

This is the fourth locality in County Galway.

KERRY: Owengarrif River, Killarney National Park (V9582), 2♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

This is the second locality for County Kerry (previous Gap of Dunloe (V8787)).

***Oxyethira flavicornis* (Pictet, 1834)**

DONEGAL: Glenveagh National Park (C0221), 22♂♂3♀♀ 10-30 June 1998, Malaise trap on blanket bog/cut over blanket bog with pools, M. C. D. Speight.

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♂ 11-26 May 2019, Rothamsted Insect Survey light-trap, per A. Riley.

There are several lakes in the Zoo.

GALWAY: Connemara National Park (L7457), 9♂♂1♀ 19 May-8 June 1994, 4♂♂ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

KERRY: Lough Leane, Killarney (V9486), 10♂♂5♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

MAYO: Ballycroy (Mayo) National Park (F8607), 1♂ 3♀♀, 1♀ and 5♀♀ all 30 May-20 June 1997, Malaise traps on cut-over blanket bog along the Owenduff River, M. C. D. Speight.

WATERFORD: Ballyscanlan Lough (S5302), 1♀ 6 August 2018, swept, T. Bryant; Carrickavrantry Reservoir (S5502), 2♂♂ 14 May 2019, swept, T. Bryant; Tramore (S5701), 2♀♀ 20 August 2018, 125w MV Robinson light-trap, T. Bryant; Fenor Bog, Fennor (S5201), 2♀♀ 3 July 2019, Heath light-trap, A. Walshe.

The species was previously taken on another section of Ballyscanlan Lough.

***Oxyethira frici* Klapálek, 1891**

DONEGAL: Glenveagh National Park (C0221), 1♂4♀♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), M. C. D. Speight.

KERRY: Doolough, Killarney National Park (V9585), 1♂ 6-16 July, 1993, Malaise trap in old *Betula*/*Quercus* woods and swamp strip of *Alnus*/*Salix* at the edge of the lake and Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, all M. C. D. Speight.

KILDARE: Pollardstown Fen (N7615), 1♀ 27 June 2002, emergence trap, *Schoenus* tufa flush in Connolly's Field, J. A. Good.

This is the second locality from County Kildare (previous River Liffey at Straffan Bridge (N9229)).

***Oxyethira mirabilis* Morton, 1904 Added to the Irish list (Fig. 13)**

Two females of *Oxyethira mirabilis* were collected by Martin Speight in two Malaise traps

on bogland at Ballycroy (Mayo) National Park (F8607), County Mayo, in the west of Ireland. The species was new to Ireland (O'Connor, 2019b).

***Oxyethira sagittifera* Ris, 1897 (Fig. 14)**

DONEGAL: Glenveagh National Park (C0221), 10♂♂66♀♀ 10-30 June 1998, Malaise trap on blanket bog/cut over blanket bog with pools, M. C. D. Speight.

This is the second locality for County Donegal (previous Kilmacrennan [Leannan River] (C1420)).

KERRY: Doolough, Killarney National Park (V9585), 1♂ 6-16 July 1993, Malaise trap in old *Betula*/*Quercus* woods and swamp strip of *Alnus*/*Salix* at the edge of the lake, M. C. D. Speight; Lough Leane, Killarney (V9486), 1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

MAYO: Ballycroy (Mayo) National Park (F8607), 28♂♂83♀♀ 30 May-20 June 1997, 1♂1♀ 1-20 August 1997, Malaise traps on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

This is the second locality for County Mayo (Clare Island (L6985)).

***Oxyethira simplex* Ris, 1897 New to County Mayo (Fig. 15)**

MAYO: Ballycroy (Mayo) National Park (F8607), 11♂♂5♀♀ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, 4♀♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools, 2♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, all M. C. D. Speight.

***Oxyethira tristella* Klapálek, 1895 New to County Mayo (Fig. 16)**

MAYO: Ballycroy (Mayo) National Park (F8607), 1♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

***Tricholeiochiton fagesii* (Guinard, 1879) First Irish adult (Fig. 17)**

A female of *Tricholeiochiton fagesii* was collected by Martin Speight in a Malaise trap in the Ballycroy (Mayo) National Park (F8607), County Mayo. This is the first Irish adult of the species although larvae have been taken at several other localities (O'Connor, 2019a).

PHILOPOTAMIDAE

***Chimarra marginata* (Linnaeus, 1761)**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.

GALWAY: River Beagh (M4600), two adults 22 May 2017, H. Feeley, determined by M. Gammell from a photograph on Twitter.

***Philopotamus montanus* (Donovan, 1813) New to County Limerick**

O'Connor and McNaughton (2019) record *Philopotamus montanus* from a stream from Lough na Tullig, Garron Plateau (D2521) and Glenarm River (D3014), County Antrim.

CORK: Bere Island (V6944, V7153), larvae 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

KERRY: Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

LIMERICK: Ballymurragh East (R2330), adult 6 August 2016, on outside of 15W Actinic light-trap, K. G. M. Bond (National Biodiversity Data Centre, 2019).

WATERFORD: Glencomeragh stream (S3222), larva 15 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WEXFORD: Edenvale (T0427), 3♂♂and 1 larva 1 August 2019, small stream and a small waterfall, swept, J. P. O'Connor & M. A. O'Connor; J. F. Kennedy Park, a stream flowing into the Duck Pond (S7218), 2♂♂ 4 August 2019, swept, J. P. O'Connor & M. A. O'Connor, stream (S7119), 1♂ 30 July 2019, swept, J. P. O'Connor; Oaklands (Kelly's) Wood, stream (S7225), 6♂♂6♀♀ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Wormaldia occipitalis* (Pictet, 1834)**

DONEGAL: Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap in humid, non-calcareous oligotrphic montane unimproved grassland and scattered *Betula*/*Quercus* along a river, M. C. D. Speight.

WATERFORD: Ballyscanlan Lough (S5402), 1♂ 7 August 2018, taken on the north side of Carrickavrantry Lake, T. Bryant; Tramore (S5701), 1♀ 6 August 2018, 125w MV Robinson light-trap, T. Bryant.

WEXFORD: Oaklands (Kelly's) Wood, stream (S7225), 1♂1♀ 3 August 2019, swept, 1♂ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

ECNOMIDAE

***Ecnomus tenellus* (Rambur, 1842)**

KERRY: Lough Leane, Killarney (V9486), 12♂♂1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

POLYCENTROPODIDAE

***Cyrnus flavidus* McLachlan, 1864**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.

***Cyrnus trimaculatus* (Curtis, 1834) New to County Kilkenny (Fig. 18)**

O'Connor and McNaughton (2019) record *Cyrnus trimaculatus* from Glendun River, Knocknacarry (D2332), Lough na Bric (D2519) and Lough Fine (D2620), Garron Plateau, County Antrim.

DONEGAL: Glenveagh National Park (C0018), 1♀ 10-30 June 1998, Malaise trap on blanket bog and cutover bog, 2♂♂4♀♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along river; Glenveagh National Park (C0120), 1♀ 12 August-2 September 1998, Malaise trap in mature acidophilous *Quercus* forest; Owencarrow River, Glenveagh National Park (C0323), 6♂♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, all M. C. D. Speight.

DUBLIN: Bushy Park Lake (O1329), 2♂♂1♀ 21 July 2019, swept, J. P. O'Connor & M. A. O'Connor; River Dodder, Rathfarnham (O1328), 1♂1♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

Previously taken at the River Dodder site in 1895.

KERRY: Lough Leane, Killarney (V9486), 3♂♂ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILKENNY: Inistioge (S6337), 1♀ 15 August 2019, Heath light-trap beside a stream entering the River Nore, J. P. O'Connor & M. A. O'Connor.

MAYO: Ballycroy National Park (F8607), 3♂♂5♀♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

***Holocentropus dubius* (Rambur, 1842) (Fig. 19)**

O'Connor and McNaughton (2019) record *Holocentropus dubius* new to County Antrim from Lough Fad, Garron Plateau (D2519).

DONEGAL: Glenveagh National Park (C0221), 11♂♂4♀♀ 10-30 June 1998, Malaise trap on blanket bog/cutover blanket bog with pools, M. C. D. Speight.

***Holocentropus picicornis* (Stephens, 1836)**

DUBLIN: African Plains Pond, Dublin Zoo (O1235), 20 larvae October 2007, collected and determined J. M. Caffrey (Caffrey *et al*., 2008).

KERRY: Lough Leane, Killarney (V9486), 3♂♂3♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILDARE: artificial lake, Castletown Estate, Celbridge (N9833), 11♂♂3♀♀ 23 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

MAYO: Ballycroy (Mayo) National Park (F8607), 20♀♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

WATERFORD: Carrickavrantry Lake (S5502), 1♂ 27 August 2018, swept, T. Bryant; Tramore (S5701), 1♂ 13 August 2018, 125w MV Robinson light-trap, T. Bryant.
WEXFORD: J. F. Kennedy Park, the Duck Pond (S7218), 1♂ 30 July 2019, swept, J. P. O'Connor, 1♀ 4 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

The species was previously taken at a small road-side water-body near the Park.

***Neureclipsis bimaculata* (Linnaeus, 1758)**

GALWAY: Connemara National Park (L7457), 1♂ 20 July-10 August 1994, Malaise trap on cutover bog and *Salix* scrub near small stream, M. C. D. Speight.

This site is near the outflow from Lough Kylemore.

***Plectrocnemia conspersa* (Curtis, 1834)**

O'Connor and McNaughton (2019) record *Plectrocnemia conspersa* from Dungonnell Dam near Cargan (D1917), Lough Fad, Garron Plateau (D2519) and Lough na Bric, Garron Plateau, County Antrim.

CORK: Bere Island (V6944, V7153), larvae 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

GALWAY: Connemara National Park (L7457), 1♂4♀♀ 19 May-8 June 1994, 2♂♂1♀ 8-28 June 1994, 2♂♂5♀♀ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight; River Clare, Claregalway Bridge (M3733), 1 larva 12 July 2011 and Crusheeny Bridge (M3932), 2 larvae 12 July 2011, Aquatic Services Unit, University College Cork (RPS, 2012).

KILDARE: Pollardstown Fen (N7715), 1♀ 12 July 2002, 3♀♀ 27 July 2002, emergence traps, limnocrene tufa spring, J. A. Good.

This is the third site for County Kildare.

MAYO: Ballycroy (Mayo) National Park (F8607), 50♂♂52♀♀ 30 May-20 June 1997, 1♂3♀♀ 1-20 August 1997, Malaise traps on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River and unimproved grassland along the river, M. C. D. Speight.

***Plectrocnemia geniculata* McLachlan, 1871 New to County Cavan (Fig. 20)**

O'Connor and McNaughton (2019) record *Plectrocnemia geniculata* from Trosk marsh, Garron Plateau (D2719), County Antrim.

CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 4 larvae 19 April 2019, collected in a tributary stream of the River Cabra, J. P. O'Connor & M. A. O'Connor.

KERRY: Owengarrif River, Killarney National Park (V9582), 2♂♂3♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILDARE: Pollardstown Fen (N7615), 1♀ 27 July 2002, emergence trap at tufa ledge, artificial ponds, 1♀, emergence traps, *Schoenus* calcareous fen in Connolly's Field, 2♂♂, emergence trap 30 June 2003, tufa ledge, drain in *Fraxinu*s wood (Springbrook Wood), 1♂ 30

June 2003, emergence trap, *Schoenus* tufa flush; (N7716) 1♂3♀♀ 30 June 2003, emergence trap tufa drain, 3♂♂ 4♀♀ 30 June 2003, emergence trap, S*choenus* tufa flush, 3♂♂6♀♀ 30 June 2003, emergence trap, tufa ledge in drain, all J. A. Good.

Plectrocnemia geniculata is previously known from other sites (N7715) at Pollardstown Fen.
LIMERICK: Charleville Stream (R5424), larva late April-early May 2018 and River Camoge, bridge on R516 (R5239), larva late April-early May 2018 (Sweeney, 2018).

Callanan, Baars and Kelly-Quinn (2014) give a grid reference R8256 for *Plectrocnemia geniculata* as being in County Tipperary but the record is in County Limerick.
MAYO: Ballycroy (Mayo) National Park (F8607), 1♂2♀♀ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, M. C. D. Speight; River Aille, bridge north-west of Claureen (M1280), 1 larva 19 June 2003, collected and determined C. Bradley (Kelly-Quinn *et al.*, 2019).

These are only the second and third localities for County Mayo (previous Clare Island (L6985)).
WEXFORD: Oaklands (Kelly's) Wood, stream (S7225), 2♂♂5♀♀ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Polycentropus flavomaculatus* (Pictet, 1834)**

O'Connor and McNaughton (2019) record *Polycentropus flavomaculatus* from Glenarm River (D3014), Glendun River, Knocknacarry (D2332), Limerick Point, Cushendall (D2427) and Lough na Bric, Garron Plateau (D2519), County Antrim.
DONEGAL: Glenveagh National Park (C0221), 6♀♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), M. C. D. Speight.
DUBLIN: River Dodder, Rathfarnham (O1328), 4♂♂1♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor; River Liffey, St Catherine's Park (O0235), 1♂ 27 September 2018, swept, J. P. O'Connor & M. A. O'Connor.
KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♂ 30 June 2019, swept J. P. O'Connor & M. A. O'Connor.
KILKENNY: River Nore, Bennettsbridge (S5549), 1♂ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
LIMERICK: River Mahor, O'Carroll's Bridge (R6837), larva late April-early May 2018 and River Maigue, Drewscourt Bridge (R4825), larva late April-early May 2018 (Sweeney, 2018).
TIPPERARY: River Suir, Clonmel (S2122), 1♂ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
WATERFORD: Carrickavrantry Lake (S5502), 1♂ 13 August 2018, swept, T. Bryant.

***Polycentropus irroratus* (Curtis, 1835) New to County Kilkenny (Fig. 21)**

DONEGAL: Glenveagh National Park (C0120), 11♂♂1♀ 12 August-2 September 1998, Malaise trap in mature acidophilous *Quercus* forest, M. C. D. Speight.

This is the second locality for County Donegal (previous Kilmacrennan district (C1420)).

KERRY: Lough Leane, Killarney (V9486), 1♂ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILKENNY: River Nore, Bennettsbridge (S5549), 5♂♂2♀♀ 10 August 2019, (S5550), 2♂♂ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

***Polycentropus kingi* McLachlan, 1881 New to County Waterford (Fig. 22)**

DONEGAL: Glenveagh National Park (C0018), 23♂♂6♀♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along a river, M. C. D. Speight.

MAYO: Ballycroy (Mayo) National Park (F8607), 2♂♂1♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, 18♂♂3♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, all M. C. D. Speight; Cloonlee River, Cloonconra (M2798), 1 larva September 2003 and River Moy tributary, Ardacarha River (M2996), 6 larvae September 2003, all M. J. Costello (Mayo County Council, 2007).

WATERFORD: Tramore (S5701), 1♀ 20 August 2018, 125w MV Robinson light-trap, T. Bryant.

PSYCHOMYIIDAE

***Lype phaeopa* (Stephens, 1836) New to Counties Carlow and Kildare (Fig. 23)**

O'Connor and McNaughton (2019) record *Lype phaeopa* new to County Antrim from Lough na Trosk, Garron Plateau (D2719).

CARLOW: stream at St Mullins (S7238), 1♂ 28 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.

This is the third locality in County Donegal.

KERRY: Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILDARE: Pollardstown Fen (N7715) 1♀ 30 June 2003, emergence trap, limnocrene tufa spring, (N7716), 1♀ 30 June 2003, emergence trap, tufa ledge in drain, all J. A. Good; River Liffey, Castletown Estate, Celbridge (N9733), 1♀ 25 September 2019, J. P. O'Connor & M. A. O'Connor.

***Lype reducta* (Hagen, 1868) New to Counties Dublin and Kilkenny (Fig. 24)**

CORK: Fota Wildlife Park (W7871), 1♀ 8-14 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

A male was previously recorded from the Wildlife Park but the grid reference was erroneously given as W7874 in O'Connor (2015).

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

KILKENNY: River Nore, Bennettsbridge (S5549), 1♀ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Psychomyia pusilla* (Pictet, 1834)**

O'Connor and McNaughton (2019) record *Psychomyia pusilla* from the Glendun River, Knocknacarry (D2332), County Antrim.

DUBLIN: River Dodder, Rathfarnham (O1328), 20♂♂6♀♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

Previously taken on the river at Clonskeagh (O1730) by J. R. Harris in 1946.

KERRY: Lough Leane, Killarney (V9486), 26♂♂8♀♀ 26 June-6 July 1993, Malaise trap on Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 1 larva 21 June 2011, collected and determined J. T. Brophy (Kildare County Council, 2012); River Liffey, Castletown Estate, Celbridge (N9733), 3♂♂3♀♀ 23 June 2019 and 6♂♂5♀♀ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 48♂♂33♀♀ 10 August 2019, (S5550), 5♂♂5♀♀ 10 August 2019, all J. P. O'Connor & M. A. O'Connor.

TIPPERARY: River Suir, Clonmel (S2122), 23♂♂11♀♀ 11 August 2019, J. P. O'Connor & M. A. O'Connor.

***Tinodes maclachlani* Kimmins, 1966 (Fig. 25)**

GALWAY: Connemara National Park (L7157), 1♂ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, M. C. D. Speight.

This is the second locality for County Galway (previous Maam River (L9653)).

WEXFORD: Edenvale (T0427), 1♀ 1 August 2019, small waterfall, swept, J. P. O'Connor & M. A. O'Connor;

***Tinodes maculicornis* (Pictet, 1834) New to County Dublin (Fig. 26)**

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♂ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

The specimen may have come from either the nearby alkaline Áras or African Plains ponds.

KILKENNY: a stream tributary of the River Nore, Inistioge (S6337), 1♂ 29 July 2019, swept, J. P. O'Connor.

***Tinodes unicolor* (Pictet, 1834) New to Counties Dublin, Kildare and Kilkenny (Fig. 27)**

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♂ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

The specimen may have come from the nearby alkaline Viceregal Stream.

KILDARE: stream entering the River Liffey, Castletown Estate, Celbridge (N9833), 1♀ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 2♂♂1♀ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

Tinodes unicolor was previously only known from Counties Clare, Donegal and Wicklow.

***Tinodes waeneri* (Linnaeus, 1758)**

O'Connor and McNaughton (2019) record *Tinodes waeneri* from the Glendun River, Knocknacarry (D2332), Lough Galboly, Garron Plateau (D2823) and Loughisland, Garron Plateau (D2519), County Antrim.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 1♀ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

DONEGAL: Glenveagh National Park (C0221), 1♂3♀♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), (C0018), 4♂♂5♀♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along a river, Owencarrow River, Glenveagh National Park (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, (C0019), 1♀ 20-30 May 1998, Malaise trap in mature *Quercus* forest along the river, all M. C. D. Speight.

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 5♂♂1♀ 11-26 May 2019, 21 ♂♂ 27 May-11 June 2019, 3♂♂3♀♀ 12-30 June 2019 and 11♂♂3♀♀ 1-25 July 2019, Rothamsted Insect Survey light-trap, per A. Riley; River Dodder, Rathfarnham (O1328), 10♂♂3♀♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

There are several lakes in Dublin Zoo.

GALWAY: Connemara National Park (L7457), 1♀ 20 July-10 August 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

KILKENNY: Pil River, Piltown (S4522), 5 larvae 29 April 2009, collected and determined P. Sweeney (Kilkenny County Council, 2011).

LIMERICK: Barranahown Stream (R7024), larva late April-early May 2018 (Sweeney, 2018).

MAYO: Ballycroy (Mayo) National Park (F8607), 1♂ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, 4♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, all M. C. D. Speight.
ROSCOMMON: Lough Ree, Rinnagan (N0056), 1♂ 29 September 2018, from rocks on the lake shore, collected and determined J. T. Brophy.
WATERFORD: Carrickavrantry Lake (S5502), 1♂ 4 September 2018, swept, T. Bryant .

HYDROPSYCHIDAE

***Cheumatopsyche lepida* (Pictet, 1834)**
DUBLIN: River Liffey, carpark beside the Angler's Rest (O0935), 1♂1♀ 22 October 2018, dead in a spider's web on a lamp, J. P. O'Connor.
KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 10 larvae 15 June 2010 and upstream of the bridge at Leixlip (O0035), 5 larvae 15 June 2010, all collected and determined J. T. Brophy (Kildare County Council, 2012); River Liffey, Castletown Estate, Celbridge (N9733), 32♂♂44♀♀ 23 June 2019 and 12♂♂8♀♀ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor
KILKENNY: River Nore, Bennettsbridge (S5549), 6♂♂4♀♀ 10 August 2019, (S5550), 9♂♂4♀♀ 10 August 2019, all J. P. O'Connor & M. A. O'Connor.
LIMERICK: River Maigue, upstream of Croom (R5140), larva late April-early May 2018 (Sweeney, 2018).
TIPPERARY: River Suir at Ballynaraha (S3123), larva 14 June 2014 and River Suir at Kilshelin (S2823), larva 15 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, Clonmel (S2122), 16♂♂7♀♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
***Diplectrona felix* McLachlan, 1878**
GALWAY: Connemara National Park (L7157), 2♂♂ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, M. C. D. Speight.
KERRY: Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.
WEXFORD: J. F. Kennedy Park, a stream flowing into the Duck Pond (S7218), 3♂♂ 4 August 2019, swept, J. P. O'Connor & M. A. O'Connor; Oaklands (Kelly's) Wood stream (S7225), 3♂♂ 8 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
***Hydropsyche angustipennis* (Curtis, 1834) New to County Limerick (Fig. 28)**
LIMERICK: River Maigue, Creggane Bridge (R5327), 1 larva late April-early May 2018 (Sweeney, 2018).

MAYO: Cloonlee River, Cloonconra (M2798), 1 larva, September 2003; River Moy, Derrygaury near Foxford (G2603), 86 larvae September 2003 and River Moy, Ummoon (M2799), 1 larva September 2003, all M. J. Costello (Mayo County Council, 2007).

***Hydropsyche fulvipes* (Curtis, 1834) Second Irish record (Figs 29, 65) (Plates 1-2)**

In August 2018, a female adult of *Hydropsyche fulvipes* was collected at a small stream in Edenvale, County Wexford, confirming the presence of the species in Ireland (O'Connor, O'Connor and Gammell, 2019). The stream, a tributary of the River Sow, is short in length (*circa* 0.35km) and flows down a hill through woodland. From studying aerial photographs, it is probably spring fed. The species has now been found in similar habitat elsewhere in County Wexford (see below). Since such streams should be searched for *H. fulvipes* in other parts of Ireland, the Wexford ones are shown.

WEXFORD: stream, Oaklands (Kelly's) Wood (S7225), 1♀ 14-15 August, 2019, Heath light-trap, J. P. O'Connor & M. A. O'Connor.

***Hydropsyche instabilis* (Curtis, 1834) New to Counties Cavan, Down, Kildare and Mayo (Fig. 30)**

CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 16 larvae 19 April 2019, collected in a tributary stream of the River Cabra, J. P. O'Connor & M. A. O'Connor.

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight; Ballyhallan River near Clonmany (C3646), 6 larvae 14 October 2002, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).

These are the second and third localities for County Donegal (previous River Clady (G9684)).

DOWN: RSPB Lagoon, Harbour Estate, Belfast (J3778), 1♂ 2 September 2019, light-trap, P. Thomlinson.

DUBLIN: Owendore River (O0631), larva 2 May 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

KERRY: Owengarrif River, Killarney National Park (V9582), 2♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILDARE: stream entering the River Liffey, Castletown Estate, Celbridge (N9833), 2♀♀ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

LIMERICK: River Maigue, upstream of Croom (R5140), larva late April-early May 2018 and Ardpatrick Stream (R6420), larva late April-early May 2018 (Sweeney, 2018).

Callanan, Baars and Kelly-Quinn (2014) give a grid reference R8256 for *Hydropsyche instabilis* as being in County Tipperary but the record is in County Limerick.

MAYO: Ballycroy (Mayo) National Park (F8607), 1♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.
TIPPERARY: River Suir at Ballynaraha (S3023), larva 3 May 2014, (S3123), larva 14 June 2014; River Suir upstream of the junction with the Anner River (S2422), larva 5 August 2014 and River Suir at Poulakerry (S2923), larva 19 August 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).
WATERFORD: Fenor Bog, Fennor (S5201), 1♀ 4 July 2019, Heath light-trap, A. Walshe. River Glasha at Glenbridge (S3022), larva 15 July 2014 and Glencomeragh stream (S3222), larva 15 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).
WEXFORD: marshes beside the Maudlins River (S7328), 1♀ 12-13 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor; Maudlins Stream (S7328), 5♀♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor; Oaklands (Kelly's) Wood, stream (S7225), 1♀ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Hydropsyche pellucidula* (Curtis, 1834)**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 2♀♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.
KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♀ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.
KILKENNY: Glasha River, Glasha Crossroads (S2776), 2 larvae 10-11 March 2010; River Goul, Ballinafrase (S3173), 145 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 61 larvae10-11 March 2010 and River Goul, Foulkscourt North (S2868), 22 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).
LIMERICK: River Maigue, downstream of the confluence with the River Loobagh (R5427), larva late April-early May 2018; River Maigue, west of Dromacommer (R5432), larva late April-early May 2018; River Maigue, Glenma Townland (R5334), larva late April-early May 2018; River Maigue,Cherrygrove Bridge (R5238), larva late April-early May 2018; River Loobagh, Riversfield Bridge (R6326), larva late April-early May 2018; Morning Star River,Gormanstown Bridge (R6632), larva late April-early May 2018; Morning Star River, upstream of Maigue (R5433), larva late April-early May 2018 and River Camoge, Gortacloona Bridge (R6837), larva late April-early May 2018 (Sweeney, 2018).
TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; River Suir at Ballynaraha (S3023), larva 3 May 2014, (S3123), larva 14 June 2014; River Suir upstream of the junction with the Anner River (S2422), larva 5 August 2014; River Anner at Thornybridge (S2427), larva 19 August 2014 and River Suir at Poulakerry (S2923), larva 19 August 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

***Hydropsyche siltalai* Döhler, 1963**

ANTRIM: Jubilee Farm, near Glynn River, Larne (J3999), 1♀ July 2019, light-trap, P. Thomlinson.

CORK: Bere Island (V6944, V7143), larvae 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

DONEGAL: Glenveagh National Park (C0018), 1♀ 10-30 June 1998, Malaise trap on blanket bog and cutover bog, M. C. D. Speight.

KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 40 larvae 15 June 2010 and upstream of the bridge at Leixlip (O0035), 6 larvae 15 June 2010, all collected and determined J. T. Brophy (Kildare County Council, 2012); River Liffey, Castletown Estate, Celbridge (N9733), 8♂♂3♀♀ 23 June 2019 and 2♂♂ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Goul, Ballinafrase (S3173), 46 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 328 larvae 10-11 March 2010 and River Goul, Foulkscourt North (S2868), 6 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).

LIMERICK: River Maigue,Cherrygrove Bridge (R5238), larva late April-early May 2018; Barranahown Stream (R7024), larva late April-early May 2018; River Camoge, Gortacloona Bridge (R6837), larva late April-early May 2018 and River Camoge, bridge on R516 (R5239), larva late April-early May 2018 (Sweeney, 2018).

MAYO: Ballycroy (Mayo) National Park (F8607), 2♂♂3♀♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, 50♂♂50♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, all M. C. D. Speight.

TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; River Suir, New Bridge Golden (S0034), larva 23 May 2014; River Multeen at Ballygriffin (S0040), larva 23 May 2014; River Suir at Ballynaraha (S3023), larva 3 May 2014, larva 27 July 2014; River Suir at Ballycarron bridge (S0034), larva 23 May 2014; River Suir at Kilshelin (S2823), larva 15 July 2014; River Multeen at Ballygriffin (S0040), larva 17 July 2014 and River Suir at Golden (S0138), larva 17 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WATERFORD: Belle Lake, pump house (S6605), 1♀ 1 July 2019, Heath light-trap, A. Walshe. Glencomeragh stream (S3222), larva 15 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

PHRYGANEIDAE

***Agrypnia obsoleta* (Hagen, 1864) (Fig. 31)**

O'Connor and McNaughton (2019) record *Agrypnia obsoleta* from Lough Galboly (D2823), Lough na Bric (D2519) and Loughisland (D2519), all on the Garron Plateau, County Antrim.
DONEGAL: Glenveagh National Park (C0221), 1♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh) and Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along river, all M. C. D. Speight.

The species was previously only known from two localities in County Donegal.
MAYO: Ballycroy National Park (F8607), 1♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, 2♀♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, all M. C. D. Speight.

***Agrypnia varia* (Fabricius, 1793)**

ANTRIM: Lowwood, Belfast, near Cave Hill (J3378), 2♂♂ June 2019, light-trap in garden, P. Thomlinson.

The specimens probably came from the nearby ponds on the Milewater.
DONEGAL: Glenveagh National Park (C0221), 8♂♂ 10-30 June 1998 and 1♂ 12 August-2 September 1998, Malaise traps on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), M. C. D. Speight.

***Phryganea bipunctata* Retzius, 1783 (Fig. 32)**

DUBLIN: Áras Pond, Phoenix Park (O1235), 3 larvae June 2007, collected and determined J. M. Caffrey (Caffrey *et al*., 2008).
MAYO: Ballycroy (Mayo) National Park (F8607), 2♀♀ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, M. C. D. Speight.
TIPPERARY: River Suir at New Bridge Golden (S0034), larva 23 May 2014 and River Suir at Ballynaraha (S3123), larva 5 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

***Phryganea grandis* Linnaeus, 1758**

KERRY: Lough Leane, Killarney (V9486), 2♂♂3♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

GOERIDAE

***Goera pilosa* (Fabricius, 1775)**

O'Connor and McNaughton (2019) record *Goera pilosa* from Kilgad (Riversdale) Lake (J1798), County Antrim.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 1♂ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.
DUBLIN: River Dodder, Rathfarnham (O1328), 1♂ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

Previously taken on the river at Clonskeagh (O1730) by J. R. Harris in 1945.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♀ 23 June 2019 and 1♂ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.
MAYO: Lough Conn (G1516), 1♀ 13 July 2017, collected and determined J. T. Brophy.
TIPPERARY: River Suir at Ballynaraha (S3023), larva 27 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

***Silo nigricornis* (Pictet, 1834) New to County Kilkenny (Fig. 33)**

KERRY: Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.
KILKENNY: River Goul, Ballybooden (S3677), 23 larvae 10-11 March 2010; River Goul, Foulkscourt North (S2868), 4 larvae 10-11 March 2010 and River Goul, Foulkscourt South (S2666), 2 larvae 10-11 March 2010, collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).
WEXFORD: Oaklands (Kelly's) Wood, stream (S7225), 1♂ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Silo pallipes* (Fabricius, 1781)**

O'Connor and McNaughton (2019) record *Silo pallipes* from Trosk stream, Garron Plateau (D2719), County Antrim.

GALWAY: Connemara National Park (L7157), 7♂♂ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, (L7457), 1♂ 20 July-10 August 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, all M. C. D. Speight.
MAYO: River Moy tributary, Ardacarha River (M2996), 3 larvae September 2003 and Moy tributary, Rathbaun (G2510), 1 larva September 2003, all M. J. Costello (Mayo County Council, 2007).
WEXFORD: Maudlins Stream, New Ross (S7328), 1♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

LEPIDOSTOMATIDAE

***Crunoecia irrorata* (Curtis, 1834) New to County Mayo (Fig. 34)**

KILDARE: Pollardstown Fen (N7616), 1♂3♀♀ 30 June 2003, emergence trap, tufa ledge in drain in *Fraxinus* wood, (N7615), 1♂10♀♀ 30 June 2003, emergence trap, tufa ledge in drain in *Fraxinus* wood (Springbrook Wood), J. A. Good.

This is the second locality for County Kildare (previous Louisa Bridge (N9936)).

KILKENNY: stream entering River Nore, Inistioge (S6337), 1♀ 15 August 2019, Heath light trap, J. P. O'Connor & M. A. O'Connor.

The species was previously only known in County Kilkenny from a stream and waterfall near Inistioge (S6437).

MAYO: Clare Island (L6784), larva 11 June 2016, collected and determined S. Atkinson (National Biodiversity Data Centre, 2019).

***Lepidostoma hirtum* (Fabricius, 1775)**

O'Connor and McNaughton (2019) record *Lepidostoma hirtum* from the Glendun River, Knocknacarry (D2332), County Antrim.

DONEGAL: Glenveagh National Park (C0018), 1♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog, (C0221), 1♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), (C0120), 10♂♂4♀♀ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus* and 1♂1♀ 12 August-2 September 1998, Malaise trap in mature acidophilous *Quercus* forest, (C0019), 1♀ 20-30 May 1998, Malaise trap in *Betula*/acidophilous *Quercus* forest with tall-herb open areas along a river; Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, all M. C. D. Speight.

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

GALWAY: River Clare, Claregalway Bridge (M3733), 12 larvae 12 July 2011 and Crusheeny Bridge (M3932), 7 larvae 12 July 2011, Aquatic Services Unit, University College Cork (RPS, 2012).

KILKENNY: River Goul, Ballinafrase (S3173), 7 larvae 10-11 March 2010 and River Goul, Ballybooden (S3677), 7 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011); Pil River, Piltown (S4522), 15 larvae 29 April 2009, collected and determined P. Sweeney (Kilkenny County Council, 2011); River Nore, Bennettsbridge (S5549), 5♂♂14♀♀ 10 August 2019, (S5550), 1♂1♀ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

LIMERICK: Morning Star River, Bruff Bridge (R6235), larva late April-early May 2018 (Sweeney, 2018).

MAYO: Ballycroy National Park (F8607), 1♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

TIPPERARY: River Multeen at Ballygriffin (S0040), larva 23 May 2014; River Suir at Ballynara (S3123), larva 14 June 2014 and River Suir at Kilshelin (S2823), larva 15 July 2014,

all collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, Clonmel (S2122), 3♂♂ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
WEXFORD: Craywell, New Ross (S7228), 1♀ 16 August 2019, on an outside wall beside a light, J. P. O'Connor & M. A. O'Connor; Oaklands (Kelly's) Wood stream (S7225), 2♀♀ 8 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

LIMNEPHILIDAE

***Drusus annulatus* (Stephens, 1837) New to Counties Donegal, Kilkenny and Mayo (Fig. 35)**

O'Connor and McNaughton (2019) record *Drusus annulatus* from the Glenarm River (D3014), County Antrim.
DONEGAL: Ballyhallan River near Clonmany (C3646), 7 larvae 10 February 2003, collected and determined C. Bradley (Kelly-Quinn *et al.*, 2019).
KILKENNY: Glasha River, Glasha Crossroads (S2776), 14 larvae 10-11 March 2010 and River Goul, Ballybooden (S3677), 6 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).
LIMERICK: Ardpatrick Stream (R6420), larva late April-early May 2018; Ballinlyna Stream (R6820), larva late April-early May 2018 and Morning Star River, near Pinker's Cross (R7228), larva late April-early May 2018 (Sweeney, 2018).

Callanan, Baars and Kelly-Quinn (2014) give a grid reference R8256 for *Drusus annulatus* as being in County Tipperary but the record is in County Limerick.
MAYO: Ballycroy National Park (F8607), 1♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.
WATERFORD: Glencomeragh stream (S3222), larva 15 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

***Ecclisopteryx dalecarlica* Kolenati, 1848 (Fig. 36)**

DONEGAL: Ballyhallan River near Clonmany (C3646), 8 larvae 14 October 2002 and Cronaniv Burn, Bridge upstream of Dunlewy Lough (B9218), 2 larvae 15 October 2002, all collected and determined C. Bradley (Kelly-Quinn *et al.*, 2019).

The species was previously known in the county from Glenveagh National Park (C0018).

***Chaetopteryx villosa* (Fabricius, 1798) New to County Mayo (Fig. 37)**

O'Connor and McNaughton (2019) record *Chaetopteryx villosa* from a Glenariff stream (D2524).
CAVAN: Woodford River, Drumgart (H3219), 1♂ 13 November 2018, from a nettle (*Urtica*) on the towpath, collected and determined J. T. Brophy.

The species was previously only known from two localties in County Cavan.

MAYO: River Aille, bridge north-west of Claureen (M1280), 10 larvae 19 June 2003 and River Clydagh, north of Castlebar (M1496), 2 larvae 31 October 2002, all collected and determined C. Bradley (Kelly-Quinn *et al.*, 2019).

***Anabolia nervosa* (Curtis, 1834) New to County Offaly (Fig. 38)**

O'Connor and McNaughton (2019) record *Anabolia nervosa* from Lough Fad, Garron Plateau (D2519) and Lough na Bric, Garron Plateau (D2519), County Antrim.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 1♂ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

LAOIS: Abbeyleix Bog, Abbeyleix (S4383), 1♀ 1 July 2017, collected and determined J. T. Brophy.

OFFALY: Lough Boora (N18181), 1♂1♀ 10 October 2018, swept from the lake-side reeds, J. P. O'Connor & M. A. O'Connor.

WICKLOW: Avoca River, Arklow (T2473), 1♂ 26 September 2017, collected and determined J. T. Brophy.

***Glyphotaelius pellucidus* (Retzius, 1783) New to Counties Kildare and Kilkenny (Fig. 39)**

ANTRIM: Lowwood, Belfast, near Cave Hill (J3378), 2♀♀ June 2019, light-trap in garden, P. Thomlinson; Montiaghs Moss (J0965), 1♀ July 2019, light-trap on bogland, P. Thomlinson.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 2♂♂ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

DOWN: Hillsborough Estate (J2457), 1♂ 13-23 May 2019, Rothamsted Insect Survey light-trap per Adrian Riley.

DUBLIN: River Dodder, Rathfarnham (O1328), 1♂ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

GALWAY: Connemara National Park (L7457), 1♂1♀ 28 April-19 May 1994, 5♀♀ 19 May-8 June 1994, 5♀♀ 8-28 June 1994, 4♂♂ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♂ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: Goresbridge (S6853), adult 21 June 2017, collected and determined T. Moore (National Biodiversity Data Centre, 2019); River Nore, Bennettsbridge (S5549), 1♂ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

MEATH: Lough Brackan near Drumconrath (N8788), 3 larvae 19 April 2019, J. P. O'Connor & M. A. O'Connor.

This is the second locality for County Meath (previous River Tolka, 5km upstream of Dunboyne on a tributary (N9844)).

WEXFORD: Craywell, New Ross (S7228), 1♀ 4-5 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Limnephilus affinis* Curtis, 1834 New to County Antrim (Fig. 40)**

ANTRIM: Lowwood, Belfast (J3378), 1♂ 15 August 2019, light-trap, P. Thomlinson.

CLARE: Ings (R3468), 1♂ 18 September 2017, collected and determined J. T. Brophy.

GALWAY: Connemara National Park (L7457), 1♀ 28 April-19 May 1994, Malaise trap on blanket bog with *Salix* scrub along a small stream, M. C. D. Speight.

OFFALY: Lough Boora (N1818), 1♀ 10 October 2018, swept from lake-side vegetation, J. P. O'Connor & M. A. O'Connor.

WEXFORD: Craywell, New Ross (S7228), 1♀ 31 July-1 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Limnephilus auricula* Curtis, 1834 New to County Down (Fig. 41)**

ANTRIM: Jubilee Farm, near Glynn River, Larne (J3999), 2♂♂ July 2019, light-trap, P. Thomlinson; Lowwood, Belfast, near Cave Hill (J3378), 2♂♂ June 2019, light-trap in garden, P. Thomlinson; Montiaghs Moss (J0965), 1♀ July 2019, light-trap on bogland, P. Thomlinson; North Belfast near Belfast Castle (J3278), 2♂♂ 18 May 2019, P. Thomlinson per P. Campbell, CEDaR.

DONEGAL: Glenveagh National Park (C0221), 1♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), (C0120) 1♂1♀ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus*, (C0019), 2♀♀ 20-30 May 1998 and 1♀ 12 August-2 September 1998, Malaise trap in *Betula*/acidophilous *Quercus* forest along a river, all M. C. D. Speight; Gortyarn, Carndonagh (C4944), adult 24 April 2019, C. Gilroy, det J. P. O'Connor from <http://records.biodiversityireland.ie/api/taxon-record/456422/image> (National Biodiversity Data Centre, 2019).

DOWN: Glencraig (J4381), 1♂ 25 May 2019, Bioblitz, P. Thomlinson per P. Campbell, CEDaR.

GALWAY: Connemara National Park (L7457), 1♂ 28 April-19 May 1994, 1♂1♀ 19 May-8 June 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

KILKENNY: River Nore, Bennettsbridge (S5549), 1♂1♀ 10 August 2019, (S5550), 1♂ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

***Limnephilus borealis* (Zetterstedt, 1840) (Plate 3)**

O'Connor and McNaughton (2019) record *Limnephilus borealis* from Lough Fad (D2519), Lough Galboly (D2823), Lough na Bric (D2519) and Loughisland (D2519), County Antrim. The species is now known from six lakes on the Garron Plateau.

***Limnephilus centralis* Curtis, 1834**

GALWAY: Connemara National Park (L7457), 1♂1♀ 28 April-19 May 1994, 1♂2♀♀ 19 May-8 June 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

***Limnephilus decipiens* (Kolenati, 1848) New to Counties Dublin, Kildare and Laois (Fig. 42)**

DUBLIN: St Brigid's GAA Club, Castleknock (O0937), 1♀ 25 August 2019, on an outside wall beside a light, J. P. O'Connor & M. A. O'Connor.

KILDARE: Pollardstown Fen (N7615), 1♀ 27 July 2002, emergence trap, tufa ledge, artificial ponds, J. A. Good.

LAOIS: Abbeyleix Bog (S4383), adult 16 October 2018, T. Claffey, determined by J. P. O'Connor from a photograph on Twitter <https://twitter.com/tinaclaffey> on which the specimen had been misidentified as *Halesus digitatus*. This specimen was also misidentified as *L. binotatus* on the National Biodiversity Data Centre's Recording System <https://records.biodiversityireland.ie/stats/taxon-stats? county _name= Laois&date_ range=2018-01-01%2000:00:00|2018-12-31%2023:59:59>.

WEXFORD: Maudlins Stream, New Ross (S7328), 2♀♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Limnephilus elegans* Curtis, 1834 New to Counties Galway and Waterford (Fig. 43)**

DONEGAL: Glenveagh National Park (C0018), 1♀ 20-30 May 1998, Malaise trap on blanket bog and cutover blanket bog and 1♀ 10-30 June 1998, Malaise trap on blanket bog and cutover bog; (C0323), 1♂1♀ 20-30 May 1998, Malaise trap in unimproved grassland and scattered *Betula*/*Quercus* along the Owencarrow River, (C0221), 1♀ 10-30 June 1998, Malaise trap on blanket bog/cutover blanket bog with pools, all M. C. D. Speight.

This is the second locality for County Donegal (previous Dunlewy (B9119)).

GALWAY: Connemara National Park (L7457), 2♂♂ 19 May-8 June 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

MAYO: Ballycroy (Mayo) National Park (F8607), 1♂2♀♀ 30 May-20 June 1997, Malaise trap on cut-over blanket bog along the Owenduff River, 1♀ 30 May-20 June 1997, Malaise trap on cutover blanket bog, *Ulex* thickets and pools near the Owenduff River, all M. C. D. Speight.

This is the second locality for County Mayo (previous Glenamoy Bog (F9033)).

WATERFORD: Fenor Bog, Fennor (S5201), 1♀ 4 July 2019, Heath light-trap, A. Walshe.

***Limnephilus flavicornis* (Fabricius, 1787) New to Counties Antrim, Kilkenny and Limerick (Fig. 44)**

ANTRIM: Montiaghs Moss (J0965), 1♂ July 2019, light-trap on bogland, P. Thomlinson.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 13♂♂6♀♀ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.
KERRY: Lough Leane, Killarney (V9486), 1♂1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.
KILKENNY: River Nore, Bennettsbridge (S5549), 1♂ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
LIMERICK Curragh Chase Forest Park R4149, 1♂ 4 October 2016, J. Brophy; Cloghaready Stream (R7637), larva late April-early May 2018 (Sweeney, 2018).

The Curragh Chase Forest Park record arrived too late for inclusion in O'Connor and O'Connor (2016) but it was included in Addendum 1.
WATERFORD: Tramore (S5701), 1♀ 20 August 2018, 125w MV Robinson light-trap, T. Bryant.
WEXFORD: Craywell, New Ross (S7228), 1♀ 31 July-1 August 2019, 1♂ 1-2 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor; Curracloe (T1128), 1♀ 4 August 2019 and 1♂ 5 August 2019, marsh, swept, J. P. O'Connor.

***Limnephilus griseus* (Linnaeus, 1758)**

DONEGAL: Glenveagh National Park (C0019), 1♂ 12 August-2 September 1998, Malaise trap in *Betula*/acidophilous *Quercus* forest with tall-herb open areas along a river, M. C. D. Speight.
GALWAY: Connemara National Park (L7457), 1♂ 28 April-19 May 1994, 1♂1♀ 19 May-8 June 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.
MAYO: Ballycroy (Mayo) National Park (F8607), 1♀ 30 May-20 June 1997, 1♂ 1-20 August 1997, Malaise traps on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, 2♂♂2♀♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, all M. C. D. Speight.

***Limnephilus hirsutus* (Pictet, 1834)**

O'Connor and McNaughton (2019) record *Limnephilus hirsutus* from Aghalum (D2518), County Antrim.
KILDARE: Pollardstown Fen (N7715), 1♀ 27 July 2002 and 3♂♂1♀ 30 June 2003, emergence traps at limnocrene tufa springs, J. A. Good.

This is the second locality for County Kildare (Louisa Bridge).
WATERFORD: Ballyscanlan Lake (S5402), 1♂ 31 May 2019, 15w actinic light-trap, T. Bryant; Fenor Bog, Fennor (S5201), 3♂♂2♀♀, 4 July 2019, Heath light-trap, A. Walshe.

Previously taken in the Fennor area.

***Limnephilus ignavus* McLachlan, 1865**

WEXFORD: Edenvale (T0427), 1♀ 12 August 2019, swept, M. A. O'Connor; Maudlins Stream, New Ross (S7328), 1♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

Limnephilus ignavus has been rarely recorded in south-east Ireland. It is of interest therefore that the species has been taken on three separate occasions at Edenvale. J. J. F. X. King found it there in 1902. Subsequently M. P. Gammell took a male on 5 September 2010. The recent female, from there, was swept from the foliage of a tree on a lane running down to the River Sow where there are extensive flowing marshes.

***Limnephilus incisus* Curtis, 1834**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along river, M. C. D. Speight.

***Limnephilus lunatus* Curtis, 1834 New to Counties Laois and Limerick (Fig. 45)**

O'Connor and McNaughton (2019) record *Limnephilus lunatus* from Lough Galboly, Garron Plateau (D2823), County Antrim.

CAVAN: Lough Sheelin, Mullaghboy (N4285), 7♂♂ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

KERRY: Owengarrif River, Killarney National Park (V9582), 1♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILKENNY: Glasha River, Glasha Crossroads (S2776), 11 larvae 10-11 March 2010 and River Goul, Foulkscourt South (S2666), 28 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).

LAOIS: Ballacolla (S3781), 1♀ 20 September 2018, on a window of a house, M. Brennan, determined by J. P. O'Connor from a photograph on Twitter.

LIMERICK: Lyragh Stream (R4224), larva late April-early May 2018 and River Mahor, Bridge on R516 (R7235), larva late April-early May 2018 (Sweeney, 2018).

MEATH: Lough Brackan near Drumconrath (N8788), 2 larvae 19 April 2019, J. P. O'Connor & M. A. O'Connor.

TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; Cappa stream at Ballynaraha (S3023), larva 3 May 2014, (S3123), larva 14 June 2014; River Suir at Ballycarron bridge (S0034), larva 23 May 2014; River Multeen at Ballygriffin (S0040), larva 23 May 2014 and River Suir at Ballynaraha (S3123), larva 14 June 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WEXFORD: Maudlins Stream, New Ross (S7328), 1♀ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Limnephilus luridus* Curtis, 1834**

O'Connor and McNaughton (2019) record *Limnephilus luridus* from a road to Lough Beg (H9994) and Trosk marsh, Garron Plateau (D2719), County Antrim.

DONEGAL: Glenveagh National Park (C0019), 1♀ 20-30 May 1998, Malaise trap in mature *Quercus* forest along river, (C0221), 7♂♂10♀♀ 10-30 June 1998, Malaise trap on blanket bog/cutover blanket bog with pools, all M. C. D. Speight.
GALWAY: Connemara National Park (L7457), 25♂♂26♀♀ 28 April-19 May 1994, 7♂♂8♀♀ 19 May-8 June 1994, 3♂♂8♀♀ 8-28 June 1994, 2♂♂5♀♀ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near small stream, M. C. D. Speight.
KERRY: Owengarrif River, Killarney National Park (V9582), 3♂♂13♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.
WATERFORD: Fenor Bog, Fennor (S5201), 1♀ 4 July 2019, Heath light-trap, A. Walshe.

***Limnephilus marmoratus* Curtis, 1834 New to County Kilkenny (Fig. 46)**

DONEGAL: Glenveagh National Park (C0018), 2♀♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic, (*Molinia*) montane, unimproved grassland along river and Owencarrow River, Glenveagh National Park (C0323), 4♀♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along river, all M. C. D. Speight.
KERRY: Lough Leane, Killarney (V9486), 2♂♂1♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.
KILKENNY: Glasha River, Glasha Crossroads (S2776), 1 larva 10-11 March 2010, collected M. Kelly-Quinn an determined M. Kelly-Quinn & J. R. Baars (EPA, 2011); River Nore, Bennettsbridge (S5549), 1♂1♀ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.
MEATH: Lough Brackan near Drumconrath (N8788), 6 larvae 19 April 2019, J. P. O'Connor & M. A. O'Connor.
WEXFORD: Craywell, New Ross (S7228), 1♂ 31 July-1 August 2019, 1♂ 3-4 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor; Curracloe (T1128), 1♀ 5 August 2019, marsh, J. P. O'Connor.

***Limnephilus nigriceps* (Zetterstedt, 1840) New to Counties Offaly and Waterford (Fig. 47)**

O'Connor and McNaughton (2019) record *Limnephilus nigriceps* from Lough na Bric, Garron Plateau (D2519), County Antrim.
OFFALY: Loch an Dochais, Boora Park (N1819), 15♂♂ 10 October 2018, swept, J. P. O'Connor & M. A. O'Connor; Lough Boora (N1818), 15♂♂ 10 October 2018, swept, J. P. O'Connor & M. A. O'Connor.
WATERFORD: Carrickavrantry Lake (S5502), 1♂ 23 October 2018, swept, T. Bryant.

***Limnephilus pati* O'Connor, 1980 (Fig. 48) (Plate 4)**

O'Connor, Good and Wallace (2019) recorded *Limnephilus pati* from Pollardstown Fen, County Kildare (N7715), based on a single male taken by J. A. Good in an emergence trap at a limnocrene tufa spring on 30 June 2003. The species is only known from four other Irish sites in Counties Donegal, Mayo, Tipperary and Westmeath.

***Limnephilus rhombicus* (Linnaeus, 1758) New to County Kerry (Fig. 49)**

KERRY: Owengarrif River, Killarney National Park (V9582), 1♂ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

LIMERICK: Charleville Stream (R5424), larva late April-early May 2018 and Cloghaready Stream (R7637), larva late April-early May 2018 (Sweeney, 2018).

***Limnephilus sparsus* Curtis, 1834**

O'Connor and McNaughton (2019) record *Limnephilus sparsus* from a bog near Lough Beg (H9994), County Antrim.

ANTRIM: Lowwood, Belfast (J3378), 1♂ 15 August 2019, light-trap, P. Thomlinson.

DONEGAL: Glenveagh National Park (C0120), 2♀♀ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus*, (C0019), 4♂♂ 20-30 May 1998 and 1♀ 12 August-2 September 1998, Malaise trap in *Betula*/acidophilous *Quercus* forest with tall-herb open areas along a river, all M. C. D. Speight.

GALWAY: Connemara National Park (L7457), 3♂♂5♀♀ 28 April-19 May 1994, 8♂♂3♀♀ 19 May-8 June 1994, 1♀ 8-28 June 1994, 1♂1♀ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, all M. C. D. Speight.

KERRY: Owengarrif River, Killarney National Park (V9582), 2♂♂ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

WATERFORD: Fenor Bog, Fennor (S5201), 1♀ 4 July 2019, Heath light-trap, A. Walshe.

***Limnephilus stigma* Curtis, 1834 New to County Mayo (Fig. 50)**

O'Connor and McNaughton (2019) record *Limnephilus stigma* from Loughisland, Garron Plateau (D2519), County Antrim.

MAYO: Ballycroy (Mayo) National Park (F8607), 2♀♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, 4♂♂2♀♀ 1-20 August 1997, Malaise trap on improved grassland along the River Owenduff River, all M. C. D. Speight.

***Limnephilus vittatus* (Fabricius, 1798)**

O'Connor and McNaughton (2019) record *Limnephilus vittatus* from Lough Galboly, Garron Plateau (D2823), County Antrim.

***Halesus digitatus* (Schrank, 1781) New to Counties Derry (Londonderry) and Donegal (Fig. 51)**

O'Connor and McNaughton (2019) record *Halesus digitatus* from the Cushendall River (D2327) and Glenariff (D2120), County Antrim.

DERRY (LONDONDERRY): Coleraine Harbour (C8432), 1♂ 11 October 2018, C. McNaughton.

DONEGAL: Ballyhallan River near Clonmany (C3646), 1 larva 4 June 2003, collected and determined C. Bradley (Kelly-Quinn *et al.,* 2019).
TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; River Multeen at Ballygriffin (S0040), larva 23 May 2014 and larva 17 July 2014 and River Suir at Ballynaraha (S3023), larva 3 May 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

***Halesus radiatus* (Curtis, 1834) New to Counties Kilkenny and Laois (Fig. 52)**

O'Connor and McNaughton (2019) record *Halesus radiatus* from Craigagh Wood, Cushendun (D2232), Lough Fad, Garron Plateau (D2519), Lough na Bric, Garron Plateau (D2519) and Loughisland, Garron Plateau (D2519), County Antrim.
CAVAN: Lough Sheelin, Mullaghboy (N4285), 2♂♂1♀ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.
DONEGAL: Glenveagh National Park (C0018), 6♂♂ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along a river and Owencarrow River, Glenveagh National Park (C0323), 1♀ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along river, all M. C. D. Speight.
DUBLIN: River Liffey, (O0935), 1♂ 22 October 2018 , dead in a spider's web on a lamp in the carpark beside the Angler's Rest, J. P. O'Connor; River Liffey, Lucan Demesne (O0235), 1♀ 18 November 2018, hiding alive in a crevice in the bark of an oak *Quercus* tree, J. P. O'Connor & M. A. O'Connor; St Brigid's GAA Club, Castleknock (O0937), 1♀ 20 October 2018, freshly killed in a spider's web on a wall lamp, M. A. O'Connor.

This is the latest November date.

KILKENNY: Glasha River, Glasha Crossroads (S2776), 38 larvae 10-11 March 2010; River Goul, Ballinafrase (S3173), 14 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 20 larvae 10-11 March 2010; River Goul, Foulkscourt North (S2868), 10 larvae 10-11 March 2010 and River Goul, Foulkscourt South (S2666), 6 larvae10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).
LAOIS: Ballacolla (S3781), adult 10 October 2018, on the front door of a house, M. Brennan, determined by J. P. O'Connor, from a photograph on Twitter.
LIMERICK: River Camoge, Gortacloona Bridge (R6837), larva late April-early May 2018 and River Mahor, O'Carroll's Bridge (R6837), larva late April-early May 2018 (Sweeney, 2018); Tarbert (R0748), adult 5 May 2018, collected and determined G. Hunt (National Biodiversity Data Centre, 2019).

Callanan, Baars and Kelly-Quinn (2014) give a grid reference R8256 for *Halesus radiatus* as being in County Tipperary but the record is in County Limerick.
ROSCOMMON: Lough Ree, Rinnagan (N0056), 1♀ 29 September 2018, taken by hand from *Iris pseudacorus* on the lake shore, collected and determined J. T. Brophy.

TIPPERARY: stream at Cappa Bridge (S3123), larva 3 May 2014; River Multeen at Ballygriffin (S0040), larva 23 May 2014 and Cappa stream at Ballynaraha (S3023), larva 3 May 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019).
WEXFORD: marshes at Maudlins River (S7328), 1♂ 12-13 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Micropterna lateralis* (Stephens, 1837) New to County Cavan (Fig. 53)**

CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 1♂ 19 April 2019, dead in a spider's web on a window on a toilet block in the park, J. P. O'Connor & M. A. O'Connor.
DONEGAL: Glenveagh National Park (C0120), 1♂ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus*, (C0323), 1♂1♀ 20-30 May 1998, Malaise trap in unimproved grassland and scattered *Betula*/*Quercus* along the Owencarrow River, (C0019), 1♂ 20-30 May 1998, Malaise trap in mature *Quercus* forest along river, all M. C. D. Speight.
GALWAY: Connemara National Park (L7457), 1♂2♀♀ 19 May-8 June 1994, 1♂ 8-28 June 1994, 1♀ 20 July-10 August 1994, Malaise traps on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.
WATERFORD: Belle Lake (S6605), 1♂ 10 July 2019, light-trap in woodland, A. Walshe.

***Micropterna sequax* McLachlan, 1875 New to County Kilkenny (Fig. 54)**

O'Connor and McNaughton (2019) record *Micropterna sequax* from a tributary stream of the Glenariff River (D2325), County Antrim.
DONEGAL: Glenveagh National Park (C0120), 1♀ 20-30 May 1998, Malaise trap in mature acidophilous *Quercus*, M. C. D. Speight.

This is the fourth locality in County Donegal.
GALWAY: Connemara National Park (L7457), 1♂ 8-28 June 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.
KILDARE: Pollardstown Fen (N7616), 1♀ 30 June 2003, emergence trap, tufa ledge in drain in *Fraxinus* wood, J. A. Good.

Previously known from Pollardstown Fen (N7715).
KILKENNY: Glasha River, Glasha Crossroads (S2776), 1 larva 10-11 March 2010 and River Goul, Foulkscourt South (S2666), 7 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011); small stream, Thomastown (S5842), 2 larvae 10 August 2019, J. P. O'Connor & M. A. O'Connor.

***Potamophylax cingulatus* (Stephens, 1837) New to Counties Kilkenny and Mayo (Fig. 55)**

O'Connor and McNaughton (2019) record *Potamophylax cingulatus* from Lough na Trosk, Garron Plateau (D2719), County Antrim.
CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 12 larvae 19 April 2019, collected in a tributary stream of the River Cabra, J. P. O'Connor & M. A. O'Connor.

This is the second locality for County Cavan (previous Barora River (N6894)).

DONEGAL: Glenveagh National Park (C0019), 1♀ 20-30 May 1998, Malaise trap in mature *Quercus* forest along a river, M. C. D. Speight.

GALWAY: Connemara National Park (L7157), 3♀♀ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, M. C. D. Speight. The specimens were identified using Salokannel and Mattila (2018).

This is the second locality for County Galway (previous Lough Kip River (M2231)).

KILKENNY: Glasha River, Glasha Crossroads (S2776), 1 larva 10-11 March 2010, collected M. Kelly-Quinn, determined M. Kelly-Quinn & J. R. Baars (EPA, 2011).

MAYO: River Aille, bridge north-west of Claureen (M1280), 21 larvae 31 October 2002, collected and determined C. Bradley (Kelly-Quinn *et al.*, 2019).

WEXFORD: Maudlins Stream, New Ross (S7328), 1♂ 8-9 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor; Oaklands (Kelly's) Wood, stream (S7225), 2♂♂2♀♀ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

***Potamophylax latipennis* (Curtis, 1834) New to County Kilkenny (Fig. 56)**

CAVAN: Lough Sheelin, Mullaghboy (N4285), 3♂♂ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

CORK: Bere Island (V6944, V7153), larvae 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

DONEGAL: Glenveagh National Park (C0019), 1♂ 20-30 May 1998, Malaise trap in mature *Quercus* forest along a river, M. C. D. Speight.

GALWAY: River Clare, Crusheeny Bridge (M3932), 8 larvae 12 July 2011, Aquatic Services Unit, University College Cork (RPS, 2012).

KILKENNY: River Goul, Ballinafrase (S3173), 9 larvae 10-11 March2010; River Goul, Foulkscourt North (S2868), 6 larvae 10-11 March2010 and River Goul, Foulkscourt South (S2666), 1 larva 10-11 March2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011); Pil River, Piltown (S4522), 2 larvae 29 April 2009, collected and determined P. Sweeney (Kilkenny County Council, 2011).

LIMERICK: River Maigue, Drewscourt Bridge (R4825), larva late April-early May 2018; River Maigue, Glenma Townland (R5334), larva late April-early May 2018; Lyragh Stream (R4224), larva late April-early May 2018; River Loobagh, Riversfield Bridge (R6326), larva late April-early May 2018 and River Mahor, Bridge on R516 (R7235), larva late April-early May 2018 (Sweeney, 2018).

Callanan, Baars and Kelly-Quinn (2014) give a grid reference R8256 for *Potamophylax latipennis* as being in County Tipperary but the record is in County Limerick.

***Stenophylax permistus* McLachlan, 1895 (Fig. 57)**

CAVAN: Lough Sheelin, Mullaghboy (N4285), 1♀ 16 September 2018, 6w light-trap beside the Inland Fisheries Ireland Headquarters, C. McNaughton.

GALWAY: Connemara National Park (L7457), 1♂1♀ 28 April-19 May 1994, Malaise trap on cutover bog and *Salix* scrub near a small stream, M. C. D. Speight.

MAYO: Ballycroy National Park (F8607), 1♀ 1-20 August 1997, Malaise trap on unimproved grassland along the Owenduff River, M. C. D. Speight.

Both the Galway and Mayo records are in the far west of the two counties.

WATERFORD: Ballyscanlan Lake (S5402), 1♂ 19 March 2019, 1♂1♀ 20 March 2019, 1♀ 21 March 2019, 15w actinic light-trap, T. Bryant; Tramore (S5701) 1♂ 22 March 2019, 125w MV Robinson light-trap, T. Bryant.

These Waterford records are the earliest ones for Irish adults. The known flight period is now 19 March-27 October.

SERICOSTOMATIDAE

***Sericostoma personatum* (Spence, 1826)**

O'Connor and McNaughton (2019) record *Sericostoma personatum* from Lough na Trosk, Garron Plateau (D2719), County Antrim.

CAVAN: Dún na Rí (Dún an Rí) Forest Park (N7997), 1 larva 19 April 2019, collected in a tributary stream of the River Cabra, J. P. O'Connor & M. A. O'Connor.

CORK: Bere Island (V7143, V7443), larvae 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 1♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley.

GALWAY: Connemara National Park (L7157), 1♀ 20 July-10 August 1994, Malaise trap on *Salix* scrub/bog beside a stream, M. C. D. Speight; River Clare, Claregalway Bridge (M3733), 3 larvae 12 July 2011 and Crusheeny Bridge (M3932), 5 larvae 12 July 2011, Aquatic Services Unit, University College Cork (RPS, 2012).

KILDARE: Pollardstown Fen (N7615), 1♂ 30 June 2003, emergence trap, tufa ledge in drain in *Fraxinus* wood (Springbrook Wood), J. A. Good; Johnstown [River Morell] (N9121), 1♂ 22 July 2019, H. Feeley <https://twitter.com/riverflyflint>.

KILKENNY: Glasha River, Glasha Crossroads (S2776), 2 larvae 10-11 March 2010; River Goul, Ballybooden (S3677), 16 larvae 10-11 March 2010; River Goul, Foulkscourt North (S2868), 13 larvae 10-11 March 2010 and River Goul, Foulkscourt South (S2666), 12 larvae 10-11 March 2010, all collected M. Kelly-Quinn and determined M. Kelly-Quinn & J. R. Baars (EPA, 2011); River Nore, Bennettsbridge (S5549), 3♂♂ 10 August 2019, (S5550), 2♂♂1♀ 10

August 2019, swept, all J. P. O'Connor & M. A. O'Connor; small stream, Thomastown (S5842), 1 larva 10 August 2019, J. P. O'Connor & M. A. O'Connor.

LIMERICK: Charleville Stream (R5424), larva late April-early May 2018; River Loobagh, Riversfield Bridge (R6326), larva late April-early May 2018; Ballinlyna Stream (R6820), larva late April-early May 2018 and River Mahor, Bridge on R516 (R7235), larva late April-early May 2018 (Sweeney, 2018).

MAYO: Cloonlee River, Cloonconra (M2798), 15 larvae September 2003, M. J. Costello (Mayo County Council, 2007).

TIPPERARY: Cappa stream at Ballynaraha (S3123), larva 14 June 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019); Parteen Reservoir (R6767), 1♂1♀ in cop., 2012, P. Foss, determined by J. P. O'Connor from a photograph on <http://www.fossenvironmentalconsulting. com/wildlife-photography/fauna-invertebrates---flies/caddisflies-mating.html>; River Suir at Ballynaraha (S3023), larva 3 May 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, near Cahir (S0424), 1♂ 15 June 2017, collected and determined L. Doherty <https:// www.alamy.com/stock-image-caddisfly-sericostoma-personatum-male-on-bramble-leaf-near-river-suir-167018525. html>; stream at Cappa Bridge (S3123), larva May 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WATERFORD: Glencomeragh stream (S3222), larva 15 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019).

WEXFORD: Oaklands (Kelly's) Wood, stream (S7225), 1♂ 14-15 August 2019, light-trap, J. P. O'Connor & M. A. O'Connor.

BERAEIDAE

Berea maurus (Curtis, 1834) New to Counties Carlow and Donegal (Fig. 58)

O'Connor and McNaughton (2019) record *Berea maurus* from Lough na Trosk, Garron Plateau (D2719), County Antrim.

CARLOW: St Mullins (S7237), 1♀ 2 July 2011, swept from marshy ground near the River Barrow, J. P. O'Connor.

DONEGAL: Ballyhallan River near Clonmany (C3646), 1 larva 14 October 2002, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).

KERRY: Owengarrif River, Killarney National Park (V9582), 2♀♀ 1-21 July 1995, Malaise trap on grass near the river, M. C. D. Speight.

KILDARE: Pollardstown Fen (N7615, N7616, N7716), the species was abundant (♂♂♀♀) in Malaise and emergence traps at *Schoenus* tufa flushes and tufa drains on 27 June 2002, 30 June 2003 and 28 July 2003, all J. A. Good.

Berea maurus is previously known in County Kildare from other sites (N7715) at Pollardstown Fen.

WEXFORD: J. F. Kennedy Park, a stream flowing into the Duck Pond (S7218), 1♂ 30 July 2019, swept, J. P. O'Connor.

***Beraea pullata* (Curtis, 1834)**

DUBLIN: River Dodder, Rathfarnham (O1328), 1♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

The species is new to the river's catchment.

KILDARE: Pollardstown Fen (N7715), 1♂ 27 June 2002 and 1♀ 15 June 2003, emergence traps, limnocrene tufa springs, (N7615), 1♀ 27 June 2002, Malaise trap, *Schoenus* tufa flush, 5♂♂3♀♀ 30 June 2003, emergence trap, *Schoenus* calcareous fen, 1♂ 27 June 2002, emergence trap, *Schoenus* tufa flush, 2♂♂1♀ 30 June 2003, emergence trap, *Schoenus* tufa flush, 1♀ 28 July 2003, emergence trap, *Schoenus* tufa flush, all J. A. Good.

Beraea pullata is previously known in County Kildare from 1♀ at Pollardstown Fen (N7716).

WATERFORD: Belle Lake (S6605), 1♂ 10 July 2019, light-trap in woodland, A. Walshe.

***Beraeodes minutus* (Linnaeus, 1761) New to Counties Clare, Galway and Sligo (Fig. 59)**

CLARE: River Gourna, south of Sixmilebridge (R4864), 4 larvae 23 October 2002, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).

GALWAY: Duniry River, south-west of of Duniry (M7209), 30 larvae 7 November 2002, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).

SLIGO: Owengarve River, south-east of Curry (G5503), 1 larva 30 October 2002, collected and determined C. Bradley (Kelly-Quinn *et al*., 2019).

ODONTOCERIDAE

***Odontocerum albicorne* (Scopoli, 1763) New to County Galway (Fig. 60)**

CORK: Bere Island (V7443), larva 11 June 2016, collected and determined M. Kelly-Quinn (National Biodiversity Data Centre, 2019).

GALWAY: Lough Corrib near Oughterard (M0748), adult 22 August 2016 and Lough Kip River, Oguil, Moycullen (M2231), 3 larvae 21 May 2016, kick sample, all collected and determined M. Gammell (National Biodiversity Data Centre, 2019).

WEXFORD: River Lask, Craanford (T0860), larva 6 April 2019, collected and determined H. B. Feeley <https://twitter.com/HBFeeley/ status/ 1114640399157682181>.

LEPTOCERIDAE

***Athripsodes albifrons* (Linnaeus, 1758)**

CORK: Gearagh (W3371), adult 23 August 2014, L. van der Noll, confirmed by J. P. O'Connor from a photograph on Flickr < https://www.flickr.com/photos/leonvdn/15476507091/in/photolist-pzB9na-dw76x5-ffcCB8-28oRF1M-M9mPVH>.

DUBLIN: River Dodder, Rathfarnham (O1328), 1♀ 21 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

J. R. Harris took an adult on the river at nearby Templeogue in August 1947.

KILDARE: River Liffey, upstream of a bridge at Celbridge (N9732), 2 larvae 21 June 2011, collected and determined J. T. Brophy (Kildare County Council, 2012); River Liffey, Castletown Estate, Celbridge (N9733), 1♂ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 5♂♂8♀♀ 10 August 2019, (S5550), 3♂♂ 10 August 2019, all J. P. O'Connor & M. A. O'Connor.

LIMERICK: River Camoge, south-west of Herbertstown (R6740), larva late April-early May 2018 (Sweeney, 2018).

TIPPERARY: River Suir at Ballynaraha (S3023), larva 27 July 2014, collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, Clonmel (S2122), 5♂♂8♀♀ 11 August 2019, J. P. O'Connor & M. A. O'Connor.

WEXFORD: Edenvale (T0427), 1♀ 12 August 2019, beaten from a tree near the River Sow, J. P. O'Connor & M. A. O'Connor.

***Athripsodes aterrimus* (Stephens, 1836)**

O'Connor and McNaughton (2019) record *Athripsodes aterrimus* from Kilgad (Riversdale) Lake (J1798) and Lough na Bric, Garron Plateau (D2519), County Antrim.

KILDARE: artificial lake, Castletown Estate, Celbridge (N9833), 1♂ 23 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

WATERFORD: Carrickavrantry Lake (S5502), 1♂ 27 August 2018, swept, T. Bryant.

***Athripsodes cinereus* (Curtis, 1834)**

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♀ 23 June 2019 and 2♂♂2♀♀ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 13♂♂18♀♀ 10 August 2019, (S5550), 1♂1♀ 10 August 2019, all J. P. O'Connor & M. A. O'Connor.

LIMERICK: River Maigue, upstream of Croom (R5140), larva late April-early May 2018 and River Camoge, south-west of Herbertstown (R6740), larva late April-early May 2018 (Sweeney, 2018).

TIPPERARY: River Suir at Mantlehill (S0240), larva 17 July 2014; River Suir at Kilshelin (S2823), larva 15 July 2014 and River Suir at Ballynaraha (S3023), larva 27 July 2014, all collected and determined W. Bryan (National Biodiversity Data Centre, 2019); River Suir, Clonmel (S2122), 24♂♂39♀♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Ceraclea albimacula* (Rambur, 1842) New to County Tipperary (Fig. 61)**

KILDARE: River Liffey, upstream of the bridge at Celbridge (N9732), 1 larva 15 June 2010, collected and determined J. T. Brophy (Kildare County Council, 2012).

KILKENNY: River Nore, Bennettsbridge (S5549), 1♂1♀ 10 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

TIPPERARY: River Suir, Clonmel (S2122), 1♂ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Ceraclea dissimilis* (Stephens, 1836)**

DONEGAL: Glenveagh National Park (C0221), 1♀ 10-30 June 1998, Malaise trap on blanket bog/cut-over blanket bog with pools, M. C. D. Speight.

KERRY: Lough Leane, Killarney (V9486), 3♂♂6♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

KILKENNY: River Nore, Bennettsbridge (S5549), 7♂♂7♀♀ 10 August 2019, (S5550), 2♀♀ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

WEXFORD: Craywell, New Ross (S7228), 1♂ 30-31 July 2019, light-trap, 1♀ 31 July 2019, on an outside wall beside a light, J. P. O'Connor & M. A. O'Connor; River Slaney, Enniscorthy (S9739), 1♀ 6 August, 2019, swept, J. P. O'Connor & M. A. O'Connor.

***Ceraclea fulva* (Rambur, 1842) (Fig. 62)**

Recorded as new to County Antrim from Lough na Trosk, Garron Plateau (D2719) by O'Connor and McNaughton (2019).

KERRY: Doolough, Muckross Peninsula (V9585), Killarney National Park, 1♀ 16-26 June 1993, 1♂1♀ 26 July-5 August 1993, 1♀ 5-14 September 1993, Malaise traps in old *Betula*/*Quercus* woods and swamp *Alnus*/*Salix* strip at the edge of the lake, M. C. D. Speight.

The species were previously only known at Doolough from larvae.

***Ceraclea nigronervosa* (Retzius, 1783) (Fig. 63)**

Recorded as new to County Antrim from Lough na Bric, Garron Plateau (D2519) by O'Connor and McNaughton (2019).

SLIGO: Lough Talt (G4014), larvae September 2010, anon, confirmed J. P. O'Connor from a photograph of a larva in RPS (2018).

This is the second locality for County Sligo (Lough Arrow (G7711) in 1909).

***Ceraclea senilis* (Burmeister, 1839)**

ANTRIM: Lowwood, Belfast, near Cave Hill (J3378), 1♀ June 2019, light-trap in garden, P. Thomlinson.

The specimen probably came from one of the nearby ponds on the Milewater.

***Leptocerus tineiformis* Curtis, 1834**

WEXFORD: Lower Lake, Johnstown Castle (T0216), 16♂♂23♀♀ 8 August 2019, J. P. O'Connor & M. A. O'Connor.

Leptocerus tineiformis was recorded from the other two lakes in Johnstown Castle on previous visits. However, this is the first time the species has been taken at the Lower Lake, Wexford's largest water-body. Thousands of adults occurred there.

***Mystacides azurea* (Linnaeus, 1761)**

O'Connor and McNaughton (2019) record *Mystacides azurea* from Loughisland, Garron Plateau (D2519), County Antrim.

DONEGAL: Glenveagh National Park (C0221) 4♂♂2♀♀ 12 August-2 September 1998, Malaise trap on blanket bog and cut over blanket bog with pools near Lough Veagh (Beagh), (C0018), 1♀ 12 August-2 September 1998, Malaise trap in humid non-calcareous oligotrophic (*Molinia*) montane, unimproved grassland along river, M. C. D. Speight.

DUBLIN: River Dodder, Rathfarnham (O1328), 2♂♂3♀♀ 16 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 2♂♂ 23 June 2019 and 1♂ 30 June 2019, swept, J. P. O'Connor & M. A. O'Connor.

KILKENNY: River Nore, Bennettsbridge (S5549), 1♂1♀ 10 August 2019, (S5550), 1♀ 10 August 2019, swept, all J. P. O'Connor & M. A. O'Connor.

MAYO: Ballycroy (Mayo) National Park (F8607), 1♀ 1-20 August 1997, Malaise trap on cutover blanket bog with *Ulex* thickets and pools near the Owenduff River, M. C. D. Speight.

TIPPERARY: River Suir, Clonmel (S2122), 3♂♂1♀ 11 August 2019, swept, J. P. O'Connor & M. A. O'Connor.

WATERFORD: Tramore (S5701), 1♀ 7 August 2018 and 1♀ 11 August 2018, 125w MV Robinson light-trap, T. Bryant.

***Mystacides longicornis* (Linnaeus, 1758)**

O'Connor and McNaughton (2019) record *Mystacides longicornis* from Kilgad (Riversdale) Lake (J1798), Lough na Bric, Garron Plateau (D2519) and a pale yellow wing form lecking on a rocky beach with brackish pools at Limerick Point, Cushendall (D2427), County Antrim.

CAVAN: Lough Sheelin, Walker's Bay (N4486), 1♂ 15 September 2018, collected on the shore, C. McNaughton.

DUBLIN: Dublin Zoo, Phoenix Park (O1235), 2♀♀ 1-25 July 2019, Rothamsted Insect Survey light-trap per A. Riley; Áras Pond, Phoenix Park (O1235), 3 larvae June 2007 and People's Garden Pond, Phoenix Park (O1334), 2 larvae June 2007, collected and determined J. M. Caffrey (Caffrey *et al*., 2008).
KILDARE: artificial lake, Castletown Estate, Celbridge (N9833), 1♂1♀ 23 June 2019, swept, J. P. O'Connor & M. A. O'Connor.
WATERFORD: Carrickavrantry Reservoir (S5502), 1♂ 23 May 2019, swept, a few "lekking", T. Bryant.

***Oecetis furva* (Rambur, 1842)**

DONEGAL: Owencarrow River, Glenveagh National Park (C0323), 1♂ 12 August-2 September 1998, Malaise trap on *Salix* swamp and grassland along the river, M. C. D. Speight.

***Oecetis lacustris* (Pictet, 1834) New to County Waterford (Fig. 64)**

ANTRIM: Lough Fadden, Garron Plateau (D1842), 2♂♂1♀, 22 July 2019, C. McNaughton.
KERRY: Lough Leane, Killarney (V9486), 4♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.
WATERFORD: Fenor Bog, Fennor (S5201), 1♀ 4 July 2019, A. Walshe.

***Oecetis notata* (Rambur, 1842) New to County Kildare**

KILDARE: River Liffey, Castletown Estate, Celbridge (N9733), 1♀ 30 June 2019, 15♂♂7♀♀ 7 July 2019, swept, J. P. O'Connor & M. A. O'Connor.

Previously taken on the River Liffey at Lucan, County Dublin (O0235) by J. J. F. X. King in August 1888. There has been a resurgence of *Oecetis notata* in Britain and this may also be happening in Ireland (Wallace and O'Connor, in press).

***Oecetis ochracea* (Curtis, 1825)**

O'Connor and McNaughton (2019) record *Oecetis ochracea* from Lough Fad, Garron Plateau (D2519) and Lough na Bric, Garron Plateau (D2519), County Antrim.

***Oecetis testacea* (Curtis, 1834)**

DONEGAL: Glenveagh National Park (C0019), 1♂ 12 August-2 September 1998, Malaise trap in *Betula*/acidophilous *Quercus* forest with tall-herb open areas along a river, (C0120), 2♂♂ 12 August-2 September 1998, Malaise trap in mature acidophilous *Quercus* forest, all M. C. D. Speight.
KERRY: Lough Leane, Killarney (V9486), 5♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

***Triaenodes bicolor* (Curtis, 1834)**

DUBLIN: Áras Pond, Phoenix Park (O1235), 3 larvae June 2007, collected and determined J. M. Caffrey (Caffrey *et al*., 2008).

KERRY: Lough Leane, Killarney (V9486), 5♂♂4♀♀ 26 June-6 July 1993, Malaise trap on the Muckross Peninsula beside a reed bed at the edge of the lake, M. C. D. Speight.

Acknowledgements

This paper could not have been compiled without the help of numerous interested people. The diligent collecting of Tony Bryant, Cathal McNaughton and Alan Walshe contributed many interesting records. The following also kindly supplied records, specimens, information, photographs or made data available on the internet: - Siobhan Atkinson, Ken Bond, Heather Bothwell, Catherine Bradley, Martine Brennan, John Brophy, William Bryan, Joe Caffrey, Pauline Campbell (CEDaR)), Tina Claffey, Mark Costello, Larry Doherty, Environmental Protection Agency, Ireland ("Characterisation of Reference Conditions and Testing of Typology of Rivers (RIVTYPE)", Hugh Feeley, Peter Foss, Martin Gammell, Carol Gilroy, Geoff Hunt, Mary Kelly-Quinn, Tom Moore, Catherine O'Connell (Irish Peatland Conservation Council), Pascal Sweeney, the Aquatic Services Unit of University College Cork, Pamela Thomlinson and Leon van der Noll. Jervis Good supplied a large collection of caddisflies from Pollardstown Fen. Martin Speight collected Malaise trap samples in selected Irish National Parks and made them available for study in the National Museum of Ireland. Paolo Viscardi and Mark Holmes (retired), National Museum of Ireland - Natural History, helped in selecting the Speight Malaise trap samples for examination. Liam Lysaght and Barry O'Neill provided records from the National Biodiversity Record Centre database. Adrian Riley sent the author Rothamsted Insect Survey light-trap samples taken in Ireland. Alan Morton provided the relevant software programme used for preparing the Irish distribution maps with DMAP. To all, our heart-felt thanks.

References

Barnard, P. and Ross, E. (2012) The adult Trichoptera (caddisflies) of Britain and Ireland. *Handbooks for the Identification of British Insects* **1**(17): i-iv, 1-192.

Caffrey, J. M., Coyne, J. and Gallagher, T. (2008) *Ponds of the Phoenix Park. Current ecological status and future management*. Central Fisheries Board and The Office of Public Works.
<http://phoenixpark.ie/wp-content/uploads/2019/06/ ponds-of-the-phoenix-park-current-ecological-status-and-future-management. > (accessed 22 August 2019).

Callanan, M., Baars, J.-R. and Kelly-Quinn, M. (2014) Macroinvertebrate communities of Irish headwater streams: contribution to catchment biodiversity. *Biology and Environment: Proceedings of the Royal Irish Academy* **114B**: 143-162.

Edington, J. M. and Hildrew, A. G. (1995) A revised key to the caseless caddis larvae of the British Isles with notes on their ecology. *Scientific Publications of the Freshwater Biological Association* **Number 53**: 1-134.

EPA (2011) *Integrated Pollution Prevention and Control (IPPC)Waste Licensing Galmoy Mines ltd.* Unpublished report. Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford. <http://www.epa.ie/licences/lic_eDMS/090151b280403155.pdf> (accessed 13 August 2019).

Kelly-Quinn, M. P., Bradley, C., Rippey, B. and Harrington, J. T. (2019) "Characterisation of Reference Conditions and Testing of Typology of Rivers (RIVTYPE)". Associated datasets and digitial information objects connected to this resource are available at: Secure Archive For Environmental Research Data (SAFER) managed by the Environmental Protection Agency, Ireland <http://erc.epa.ie/safer/resource?id=4256cd09-2f42-102a-b1da-b128b41032cc> (accessed 11 September 2019).

Kildare County Council (2012) *Lower Liffey Valley regional sewerage scheme annual environmental report 2011 WWDA Licence No. D0004-01.* Water Services Section, Naas.

Kilkenny County Council (2011) *Piltown Agglomeration. WS - Water Quality Monitoring - WW – Discharge License - WW206 – Piltown*. Unpublished report. <http://www.epa.ie/licences/lic_eDMS/090151b2803ee60b.pdf> (accessed 13 August 2019).

Malicky, H. (2004) *Atlas of European Trichoptera.* 2nd edition. Springer, Dordrecht.

Mayo County Council (2007) *N26 Ballina to Bohola Stage 2. Environmental Impact Statement Appendices 2007*. <http://www.regdesign.com/pdf%20files/N26-S2_EIS-Report/ Volume%202B%20 Appendices_Part-2.pdf.> (accessed13 August 2019).

National Biodiversity Data Centre (2019) JamesOConnorTrichopteraExport20190508.

Neu, P. J. (2019) Unterscheidung der Weibchen der *Hydroptila sparsa*-Gruppe. <http://www.trichoptera-rp.de/html/hydroptila_sparsa-weibchen.html> (accessed 9 July 2019).

Neu, P. J., Malicky, H., Graf, W. and Schmidt-Kloiber, A. (2018) *Distribution atlas of European Trichoptera.* Die Tierwelt Deutschlands 84. ConchBooks, Harxheim.

O'Connor, J. P. (2015) *A catalogue and atlas of the caddisflies (Trichoptera) of Ireland.* Occasional Publication of the Irish Biogeographical Society Number 11. Published by the Irish Biogeograpical Society in association with the National Museum of Ireland.

O'Connor, J. P. (2018) Caddisflies (Trichoptera) of Ireland, National Biodiversity Data Centre, Ireland. <https://maps.biodiversityireland.ie/Dataset/250>

O'Connor, J. P. (2019a) *Hydroptila vectis* Curtis, 1834 new to Ireland and the first Irish adult of *Tricholeiochiton fagesii* (Guinard, 1879) (Trichoptera: Hydroptilidae). *Entomologist's Monthly Magazine* **155**: 163-167.

O'Connor, J. P. (2019b) *Oxyethira mirabilis* Morton, 1904 (Trichoptera: Hydroptilidae), a caddisfly new to Ireland. *British Journal of Entomology and Natural History* **32**: 231-234.

O'Connor, J. P. (2019c) Caddisflies (Trichoptera) of Ireland, National Biodiversity Data Centre, Ireland <https://maps.biodiversityireland.ie/Dataset/250> (updated with Addendum 2).

O'Connor, J. P., Good, J. A. and Wallace, I. D. (2019) A new Irish locality for the rare caddisfly *Limnephilus pati* O'Connor (Trichoptera: Limnephilidae). *Entomologist's Record & Journal of Variation* **131**: 209-215.

O'Connor, J. P. and McNaughton, C. (2019) Records of caddisflies (Trichoptera) from County Antrim, Northern Ireland. *Bulletin of the Irish Biogeographical Society* **43**: 28-36.

O'Connor, J. P. and O'Connor, M. A. (2016) Some new distributional records for Irish caddisflies (Trichoptera) including a species list for Lough Neagh. *Bulletin of the Irish Biogeographical Society* **40**: 164-183.

O'Connor, J. P. and O'Connor, M. A. (2017) Further distributional and flight-period records for Irish caddisflies (Trichoptera). *Bulletin of the Irish Biogeographical Society* **41**: 51-89.

O'Connor, J. P. and O'Connor, M. A. (2018) Records of Irish caddisflies (Trichoptera) including a county list. *Bulletin of the Irish Biogeographical Society* **42**: 75-154.

O'Connor, J. P. and O'Connor, M. A. (2019) *Hydroptila lotensis* Mosely, 1930, new to Ireland and a second Irish record of *Hydroptila vectis* Curtis, 1834, (Trichoptera: Hydroptilidae). *Entomologist's Monthly Magazine* **155**: 229-234.

O'Connor, J. P., O'Connor, M. A. and Gammell, M. P. (2019) The caddisfly *Hydropsyche fulvipes* (Curtis, 1834) (Trichoptera: Hydropsychidae): finally confirmed as an Irish species. *Entomologist's Record and Journal of Variation* **131**: 26-31.

RPS (2012) Clare River (Claregalway) Flood Relief Scheme. Environmental Impact StatementVolume III – Technical Appendices. OPW, Dublin. <https://www.opw.ie/en/media/RPS%20Environmental%20Impact%20Statement%20Vol%203%20Appendices%20121112.pdf> (accessed 9 July 2019).

RPS (2018) *Lough Talt Regional Water Supply Scheme. Article 6(3) Screening for Appropriate Assessment and Natura Impact Statement Volume 1.* <http://www.sligococo.ie/planning/NaturaImpactStatements/AppendixC_Vol1_Screening%20for%20Appropriate%20Assessment%20%20Art%206(3)%20and%20NIS%20Art%206(4).pdf> (accessed 9 July 2019).

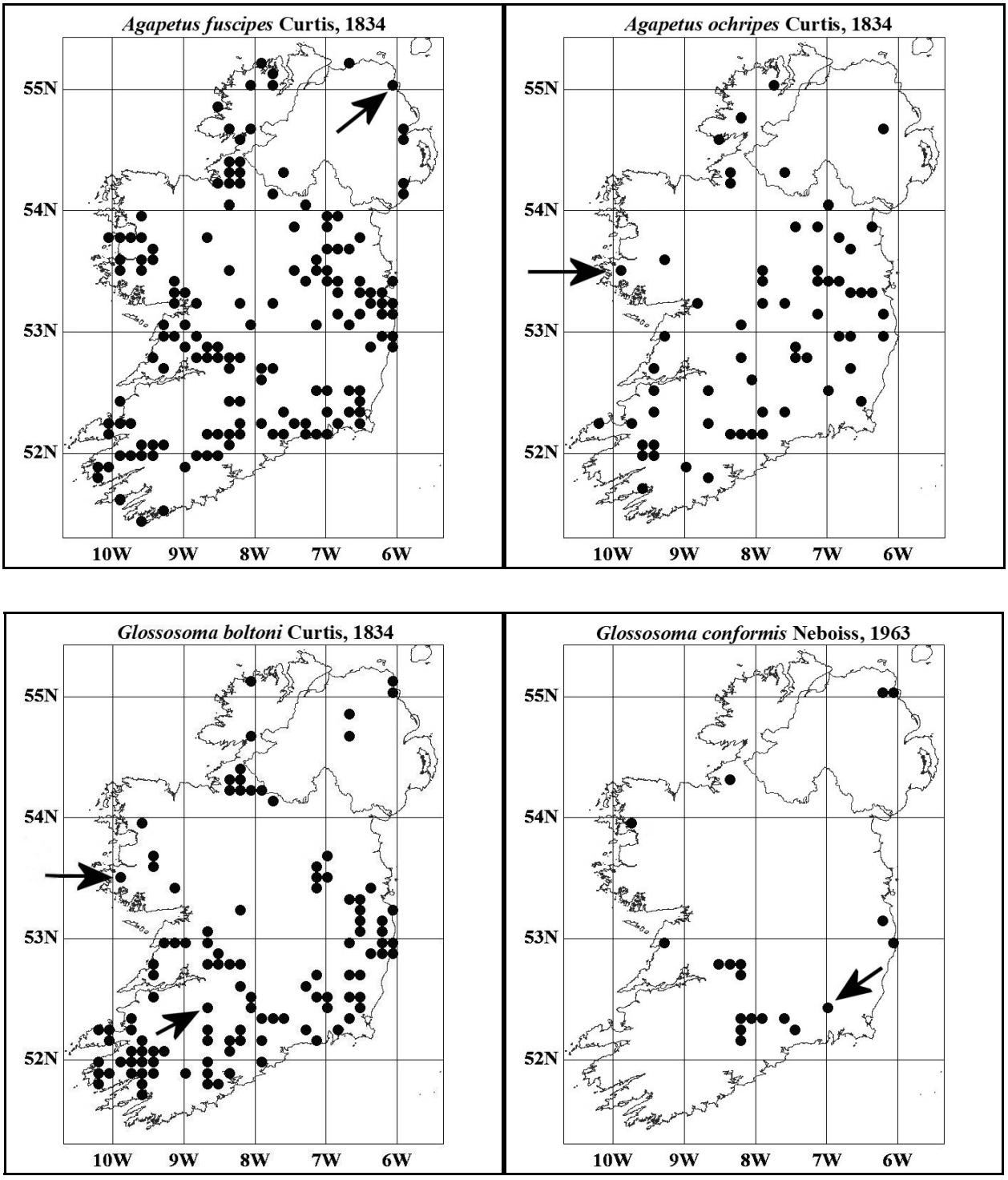
Salokannel, J. and Mattila, K. (2018) *Suomen vesiperhoset. Trichoptera of Finland*. Hyönteistarvike Tibiale Oy, Helsinki.

Sweeney, P. (2018) River Maigue Instream Biodiversity, Crayfish & Otters 2018. Report prepared for the The Maigue Trust. <https://maigueriverstrust.ie/wp-content/uploads/2019/06/Maigue-Instream-Biodiversity-Crayfish-Otters-2018-final.pdf> (accessed 4 September 2019).

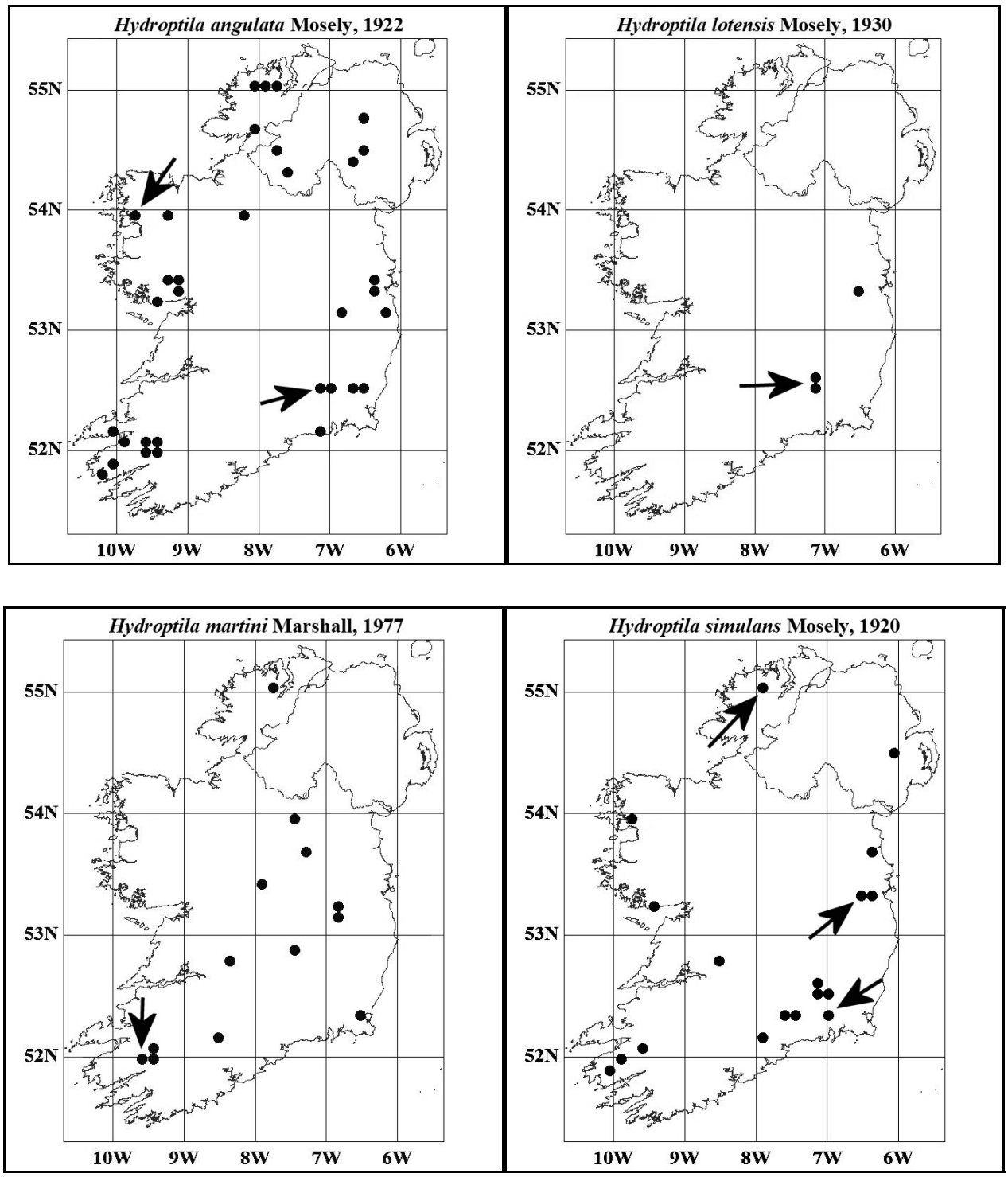
Wallace, I. D. and O'Connor, J. P (in press) Resurgence of the caddis *Oecetis notata* (Rambur, 1842) (Trichoptera: Leptoceridae) in Britain and Ireland. *Entomologist's Record & Journal of Variation.*

Wallace, I. D., Wallace, B. and Philipson, G. N. (2003) Keys to the case-bearing caddis larvae of Britain and Ireland. *Scientific Publications of the Freshwater Biological Association* **Number 61**.

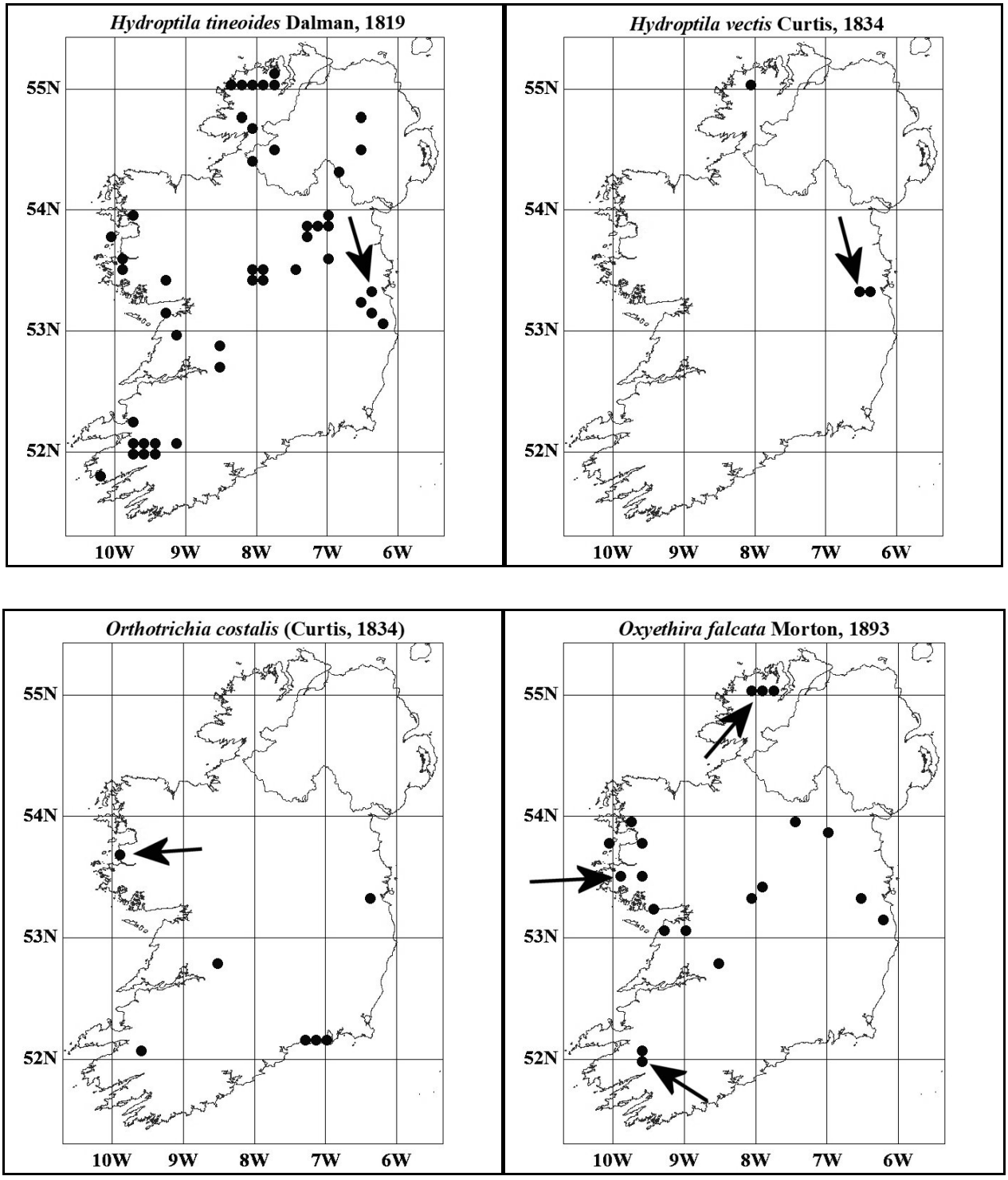
Waringer, J. and Graf, W. (2011) *Atlas der mitteleuropäischen Köcherfliegenlarven –Atlas of Central European Trichoptera larvae.* Erik Mauch Verlag, Dinkelscherben.



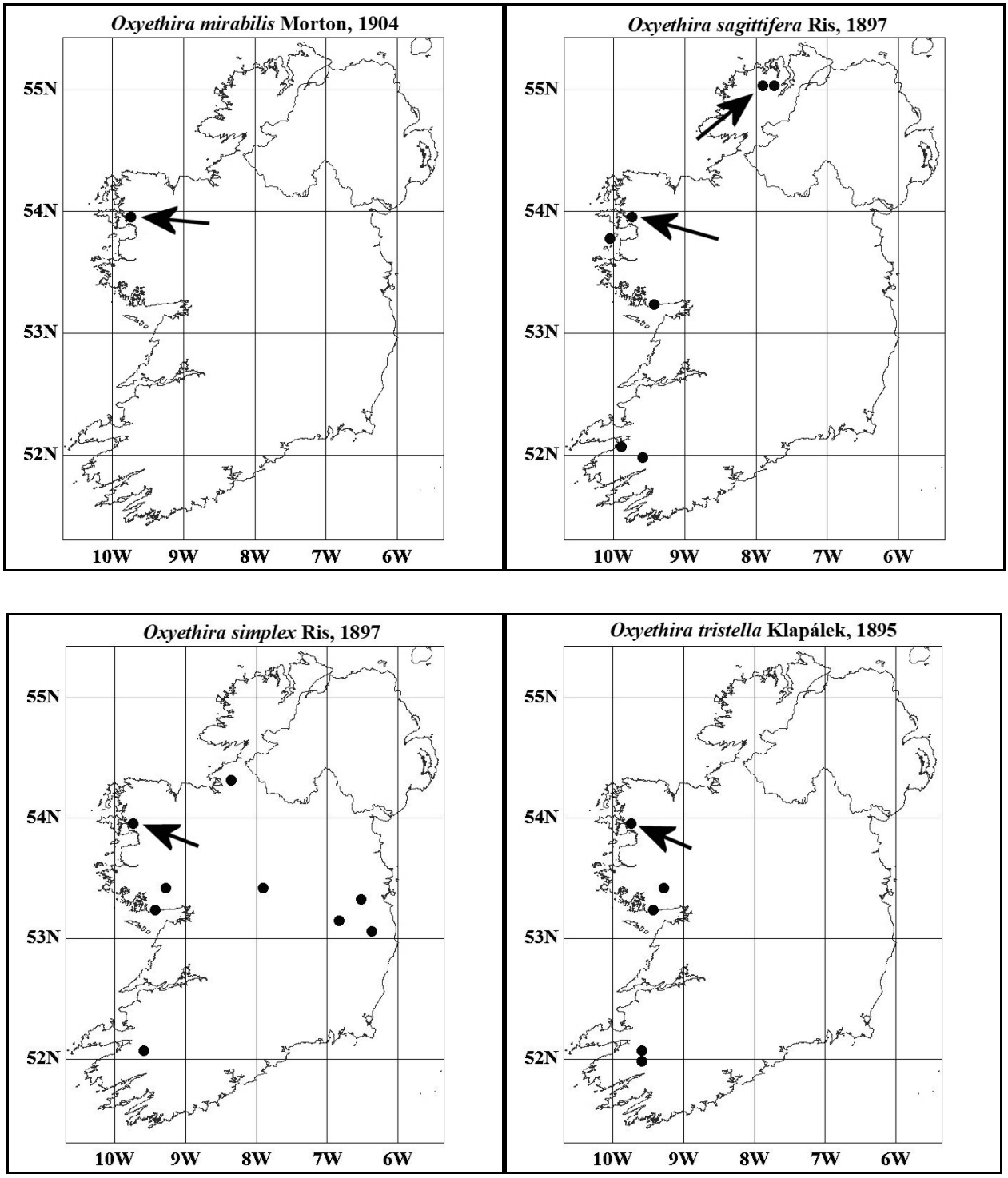
FIGURES 1-4. The known Irish distributions of *Agapetus fuscipes* Curtis, 1834, *Agapetus ochripes* Curtis, 1834, *Glossosoma boltoni* Curtis, 1834 and *Glossosoma conformis* Neboiss, 1963. The notable records are indicated by arrows.



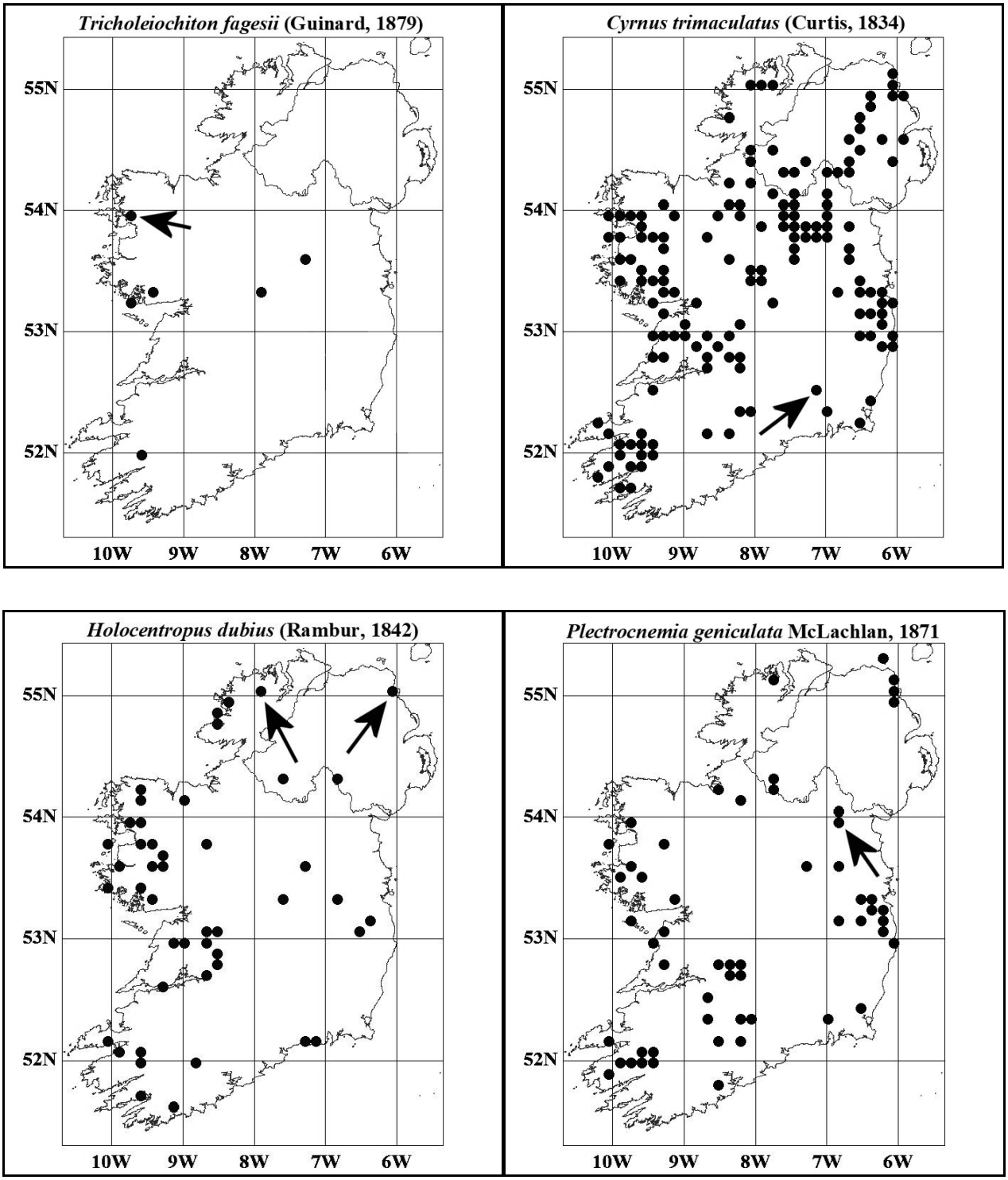
FIGURES 5-8. The known Irish distributions of *Hydroptila angulata* Mosely, 1922, *Hydroptila lotensis* Mosely, 1930, *Hydroptila martini* Marshall, 1977 and *Hydroptila simulans* Mosely, 1920. The notable records are indicated by arrows.



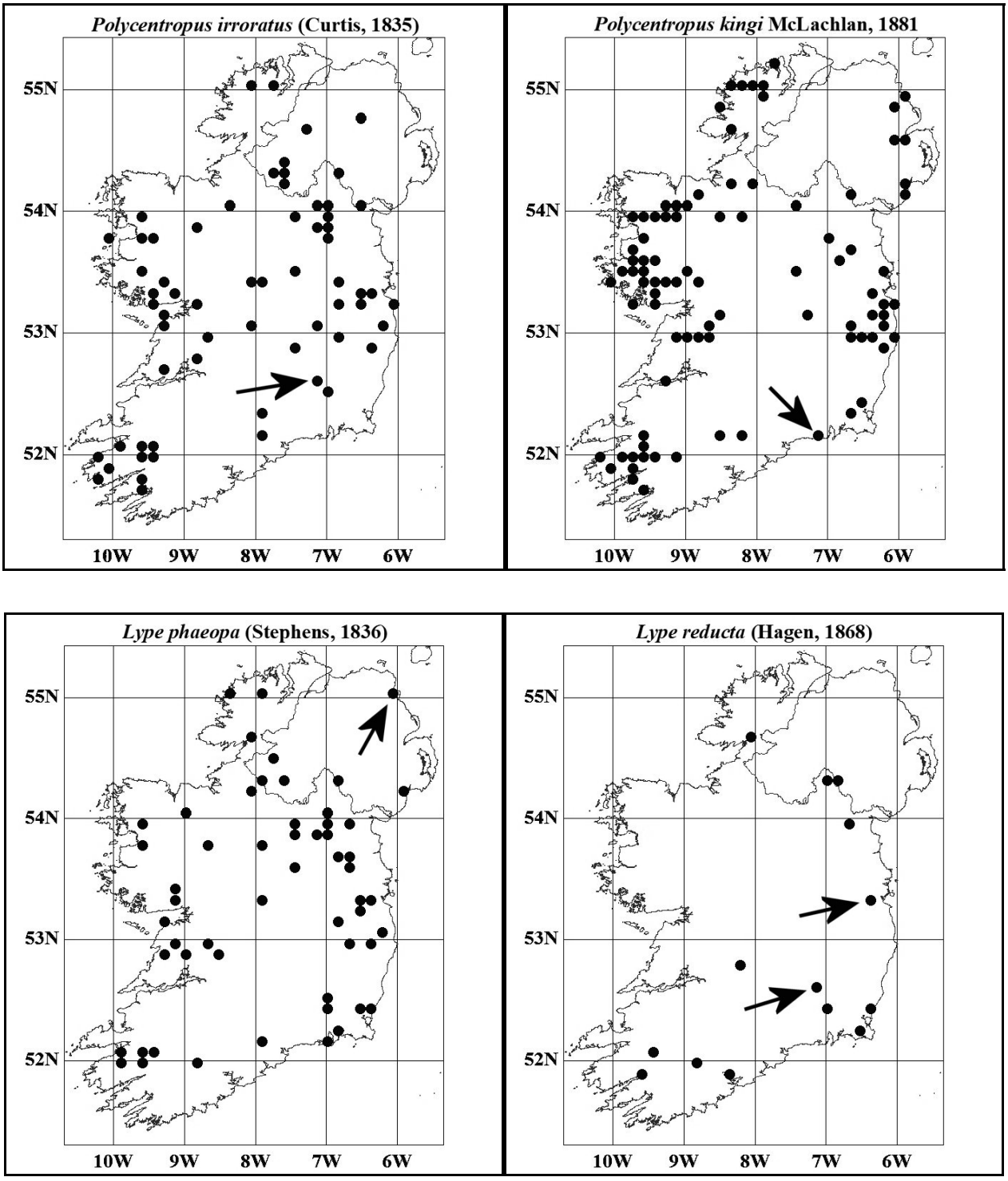
FIGURES 9-12. The known Irish distributions of *Hydroptila tineoides* Dalman, 1819, *Hydroptila vectis* Curtis, 1834, *Orthotrichia costalis* (Curtis, 1834) and *Oxyethira falcata* Morton, 1893. The notable records are indicated by arrows.



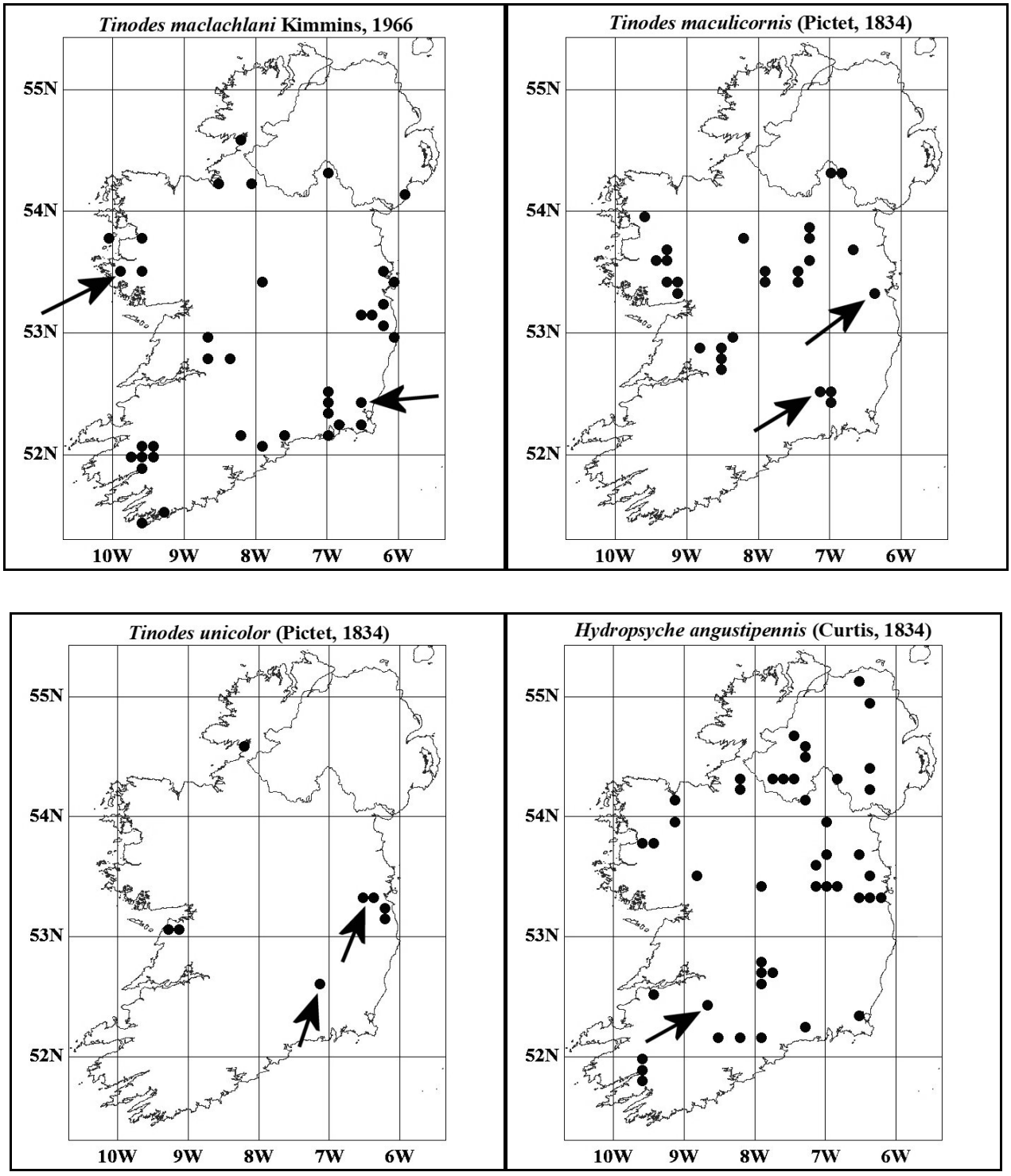
FIGURES 13-16. The known Irish distributions of *Oxyethira mirabilis* Morton, 1904, *Oxyethira sagittifera* Ris, 1897, *Oxyethira simplex* Ris, 1897 and *Oxyethira tristella* Klapálek, 1895. The notable records are indicated by arrows.



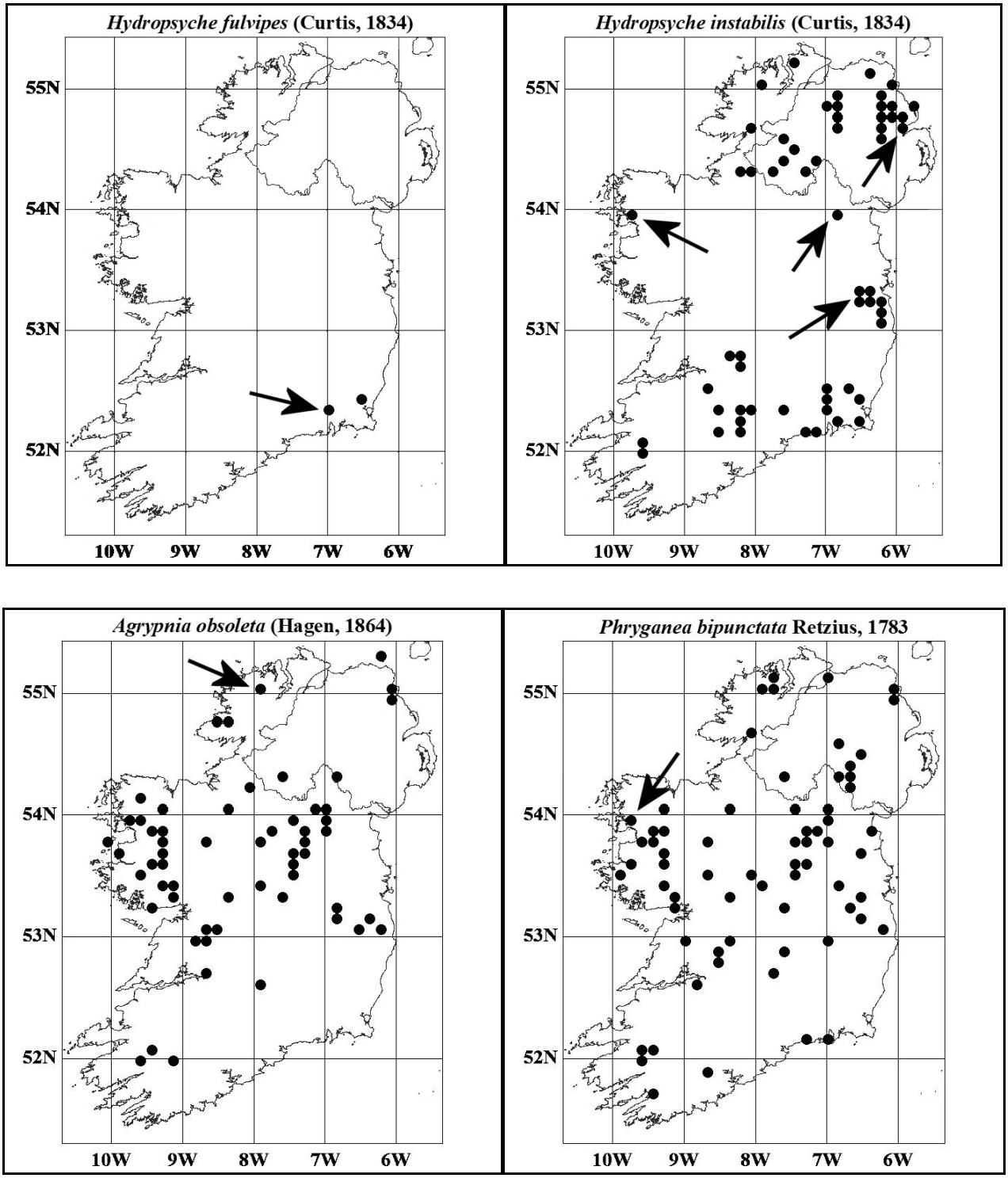
FIGURES 17-20. The known Irish distributions of *Tricholeiochiton fagesii* (Guinard, 1879), *Cyrnus trimaculatus* (Curtis, 1834), *Holocentropus dubius* (Rambur, 1842) and *Plectrocnemia geniculata* McLachlan, 1871. The notable records are indicated by arrows.



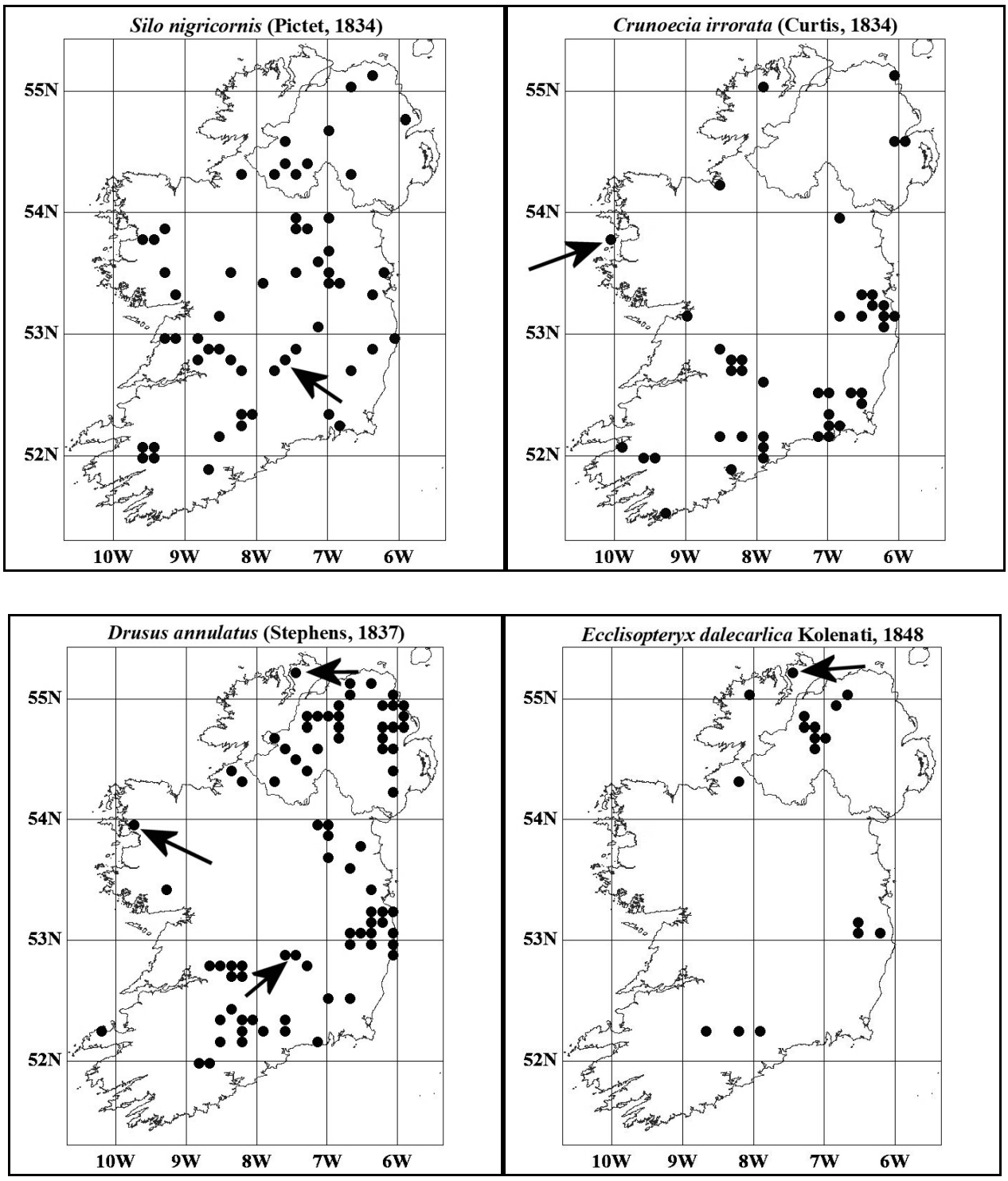
FIGURES 21-24. The known Irish distributions of *Polycentropus irroratus* (Curtis, 1835), *Polycentropus kingi* McLachlan, 1881, *Lype phaeopa* (Stephens, 1836) and *Lype reducta* (Hagen, 1868). The notable records are indicated by arrows.



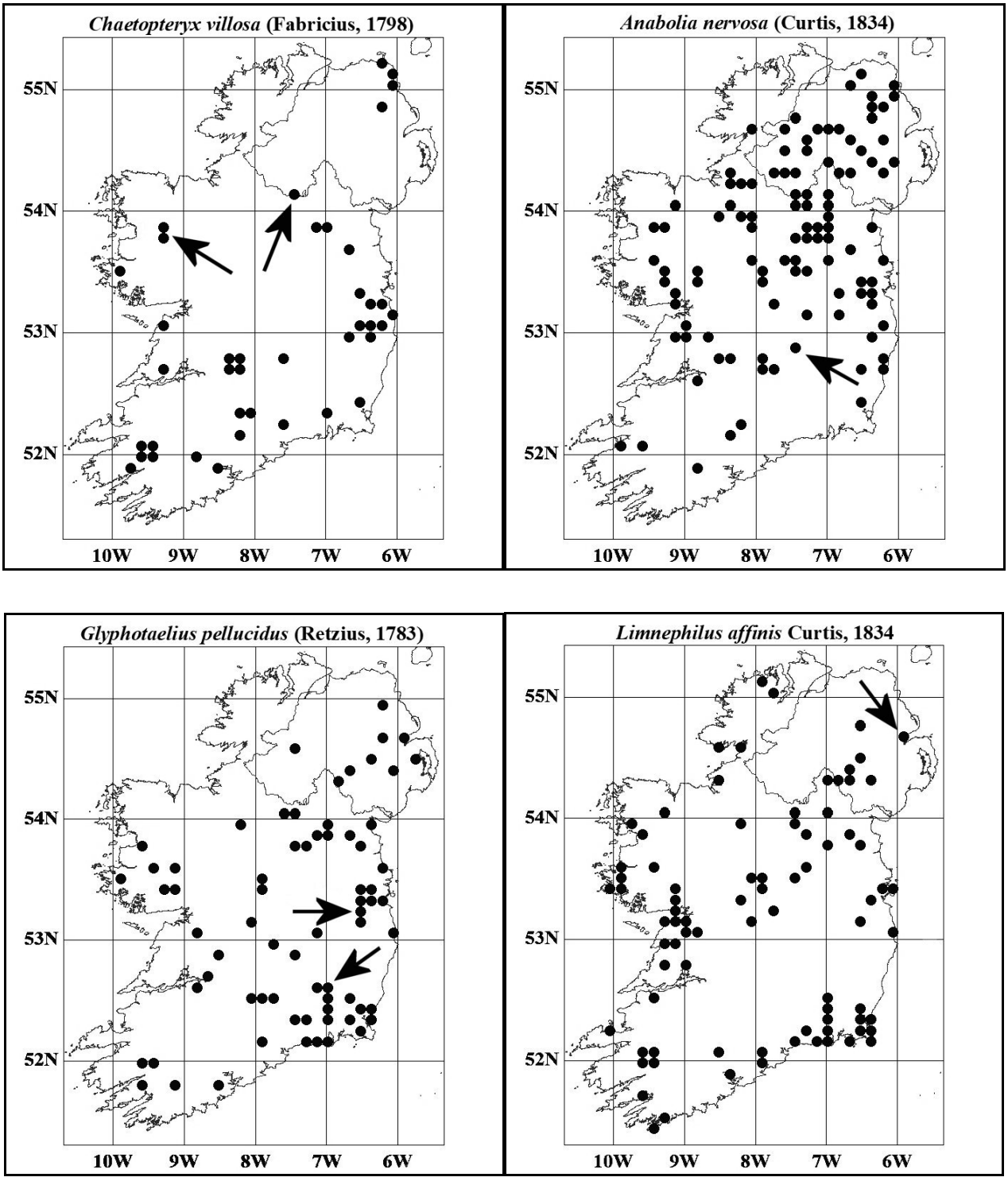
FIGURES 25-28. The known Irish distributions of *Tinodes maclachlani* Kimmins, 1966, *Tinodes maculicornis* (Pictet, 1834), *Tinodes unicolor* (Pictet, 1834) and *Hydropsyche angustipennis* (Curtis, 1834). The notable records are indicated by arrows.



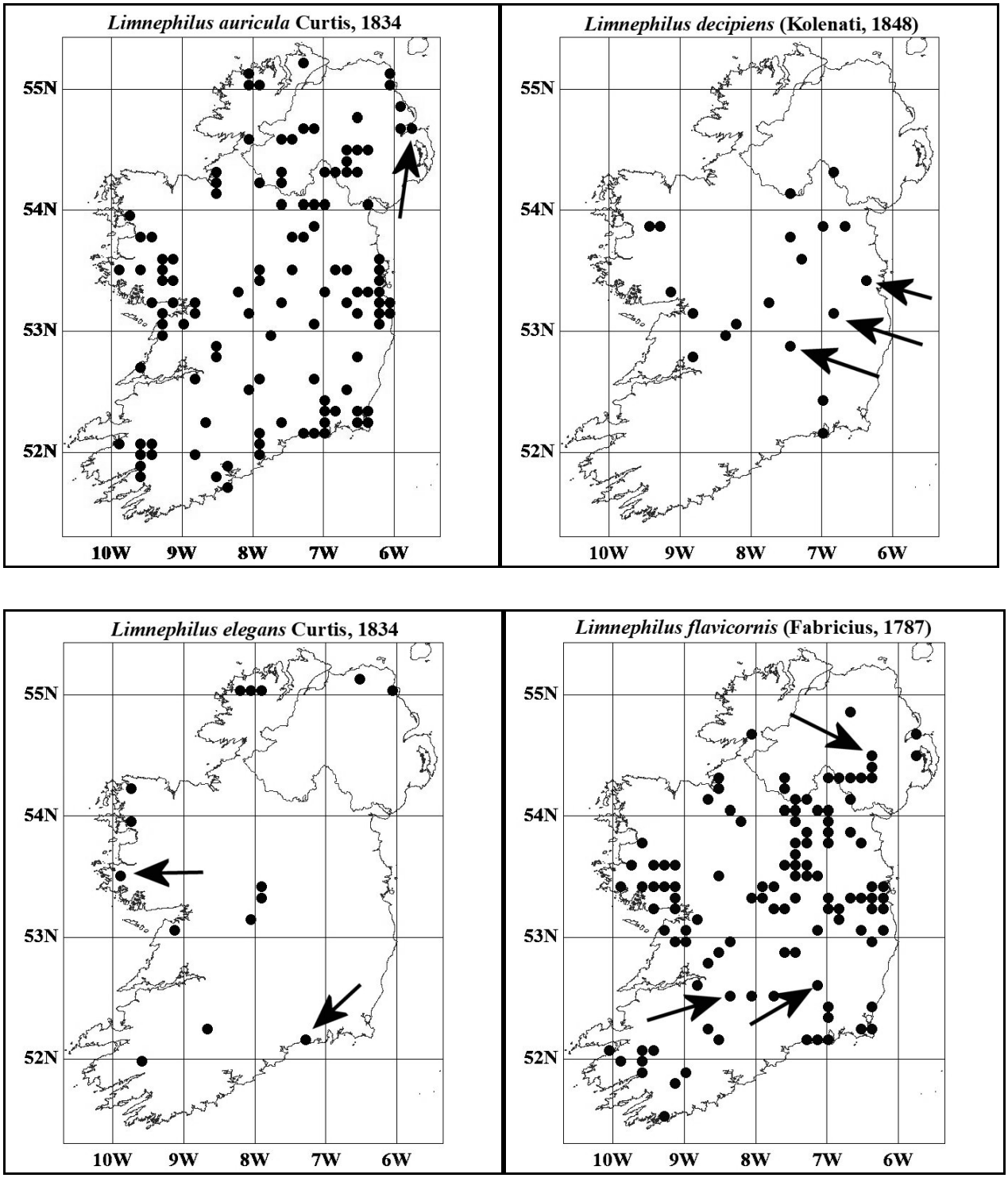
FIGURES 29-32. The known Irish distributions of *Hydropsyche fulvipes* (Curtis, 1834), *Hydropsyche instabilis* (Curtis, 1834), *Agrypnia obsoleta* (Hagen, 1864) and *Phryganea bipunctata* Retzius, 1783. The notable records are indicated by arrows.



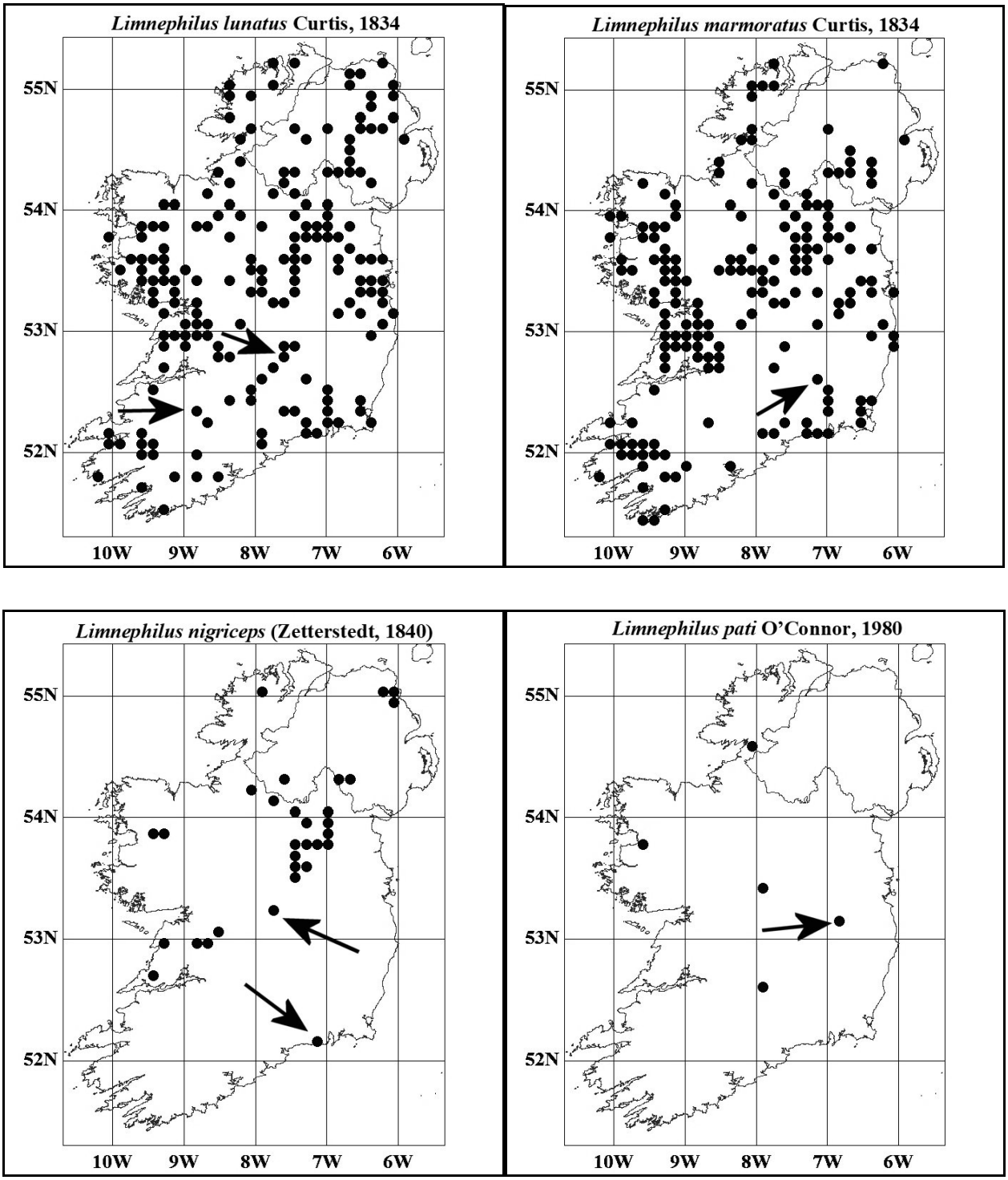
FIGURES 33-36. The known Irish distributions of *Silo nigricornis* (Pictet, 1834), *Crunoecia irrorata* (Curtis, 1834), *Drusus annulatus* (Stephens, 1837) and *Ecclisopteryx dalecarlica* Kolenati, 1848. The notable records are indicated by arrows.



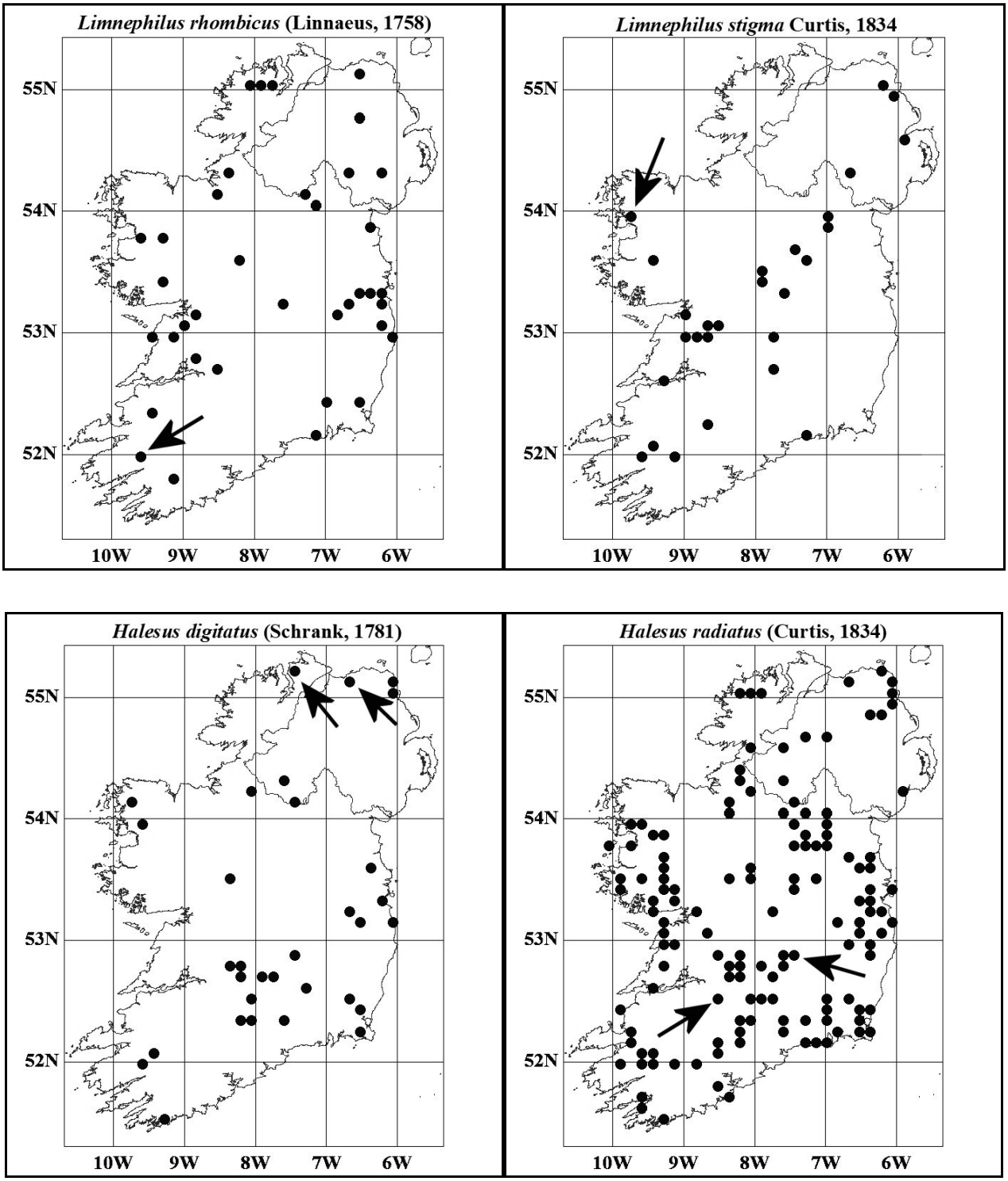
FIGURES 37-40. The known Irish distributions of *Chaetopteryx villosa* (Fabricius, 1798), *Anabolia nervosa* (Curtis, 1834), *Glyphotaelius pellucidus* (Retzius, 1783) and *Limnephilus affinis* Curtis, 1834. The notable records are indicated by arrows.



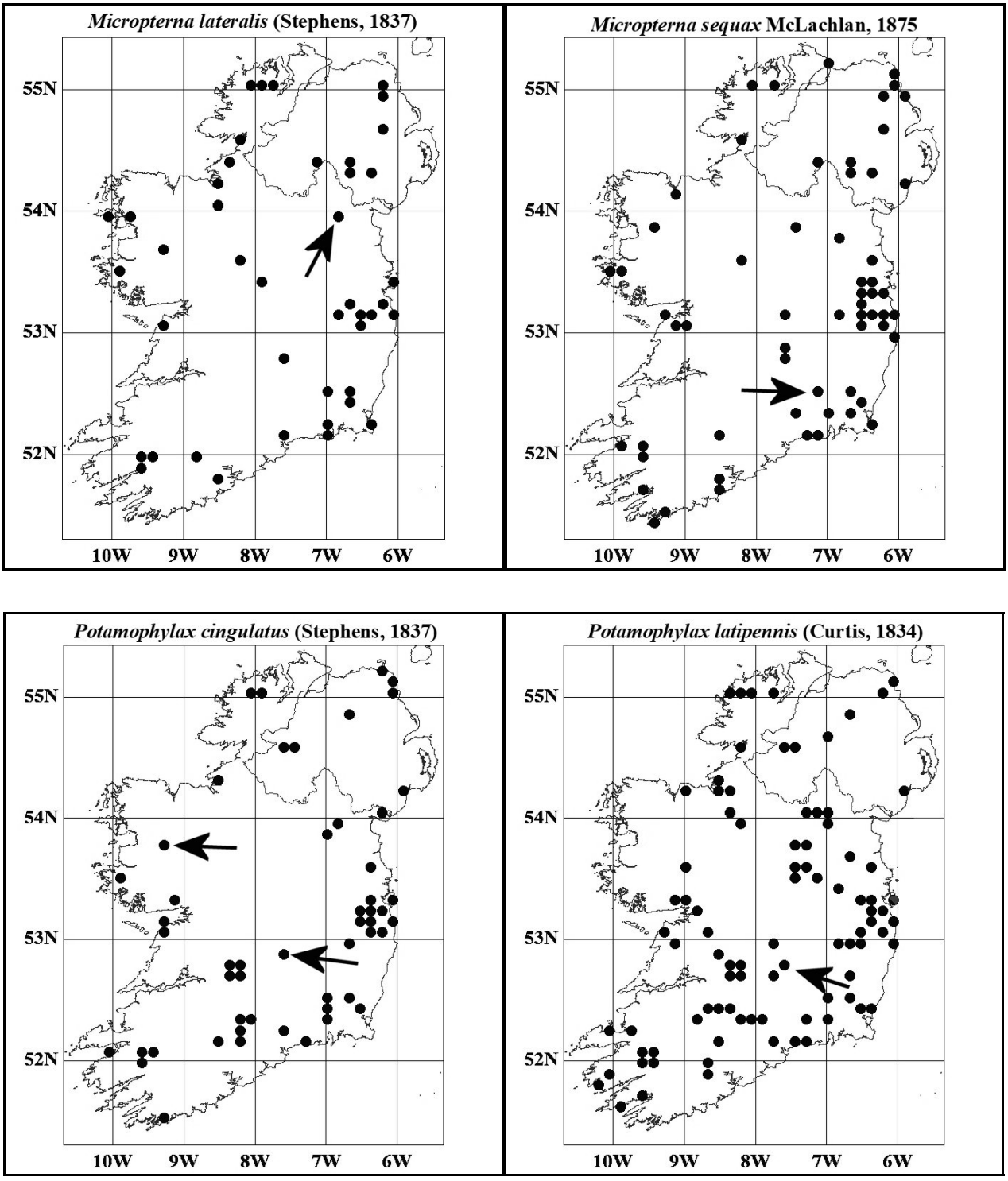
FIGURES 41-44. The known Irish distributions of *Limnephilus auricula* Curtis, 1834, *Limnephilus decipiens* (Kolenati, 1848), *Limnephilus elegans* Curtis, 1834 and *Limnephilus flavicornis* (Fabricius, 1787). The notable records are indicated by arrows.



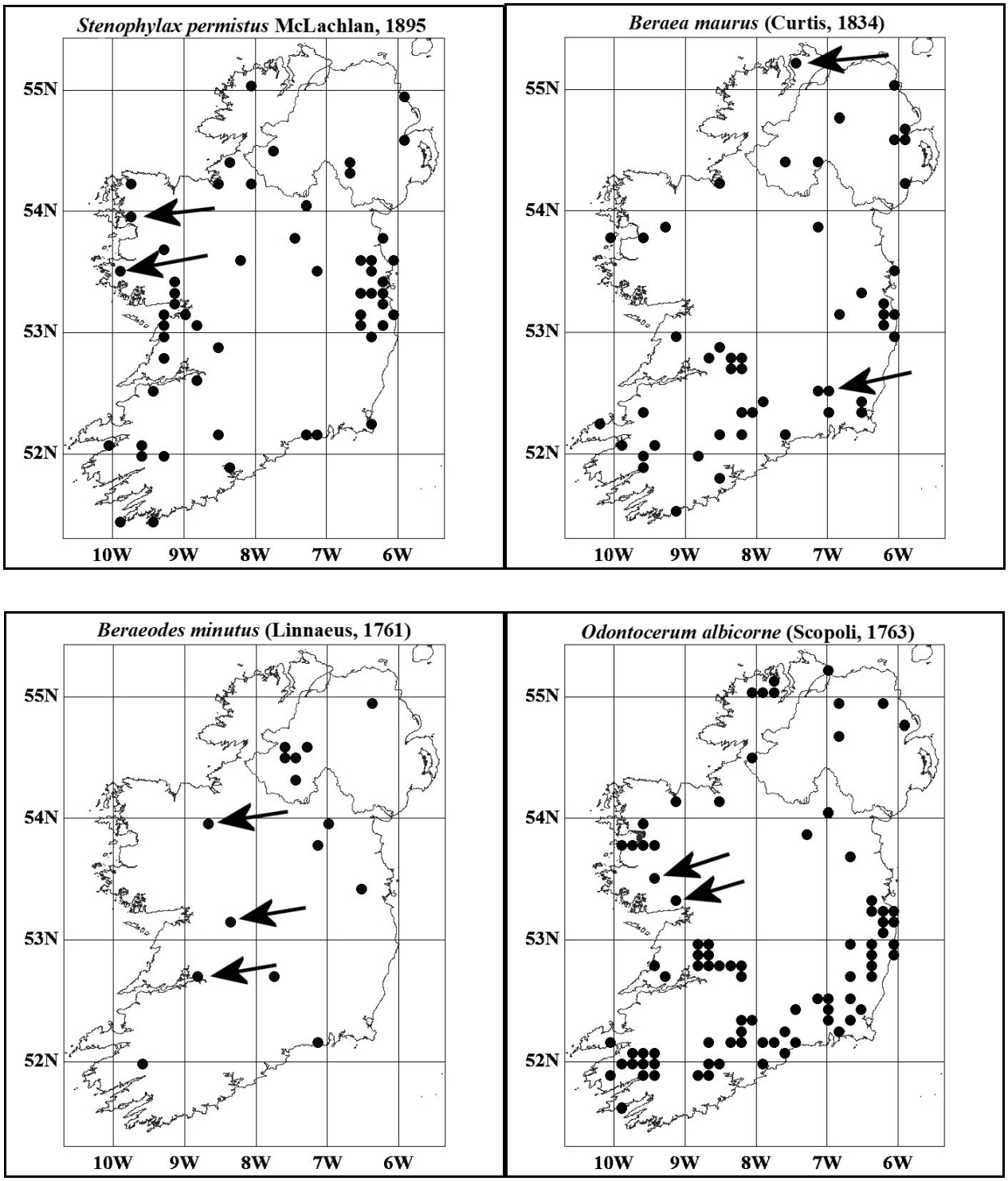
FIGURES 45-48. The known Irish distributions of *Limnephilus lunatus* Curtis, 1834, *Limnephilus marmoratus* Curtis, 1834, *Limnephilus nigriceps* (Zetterstedt, 1840) and *Limnephilus pati* O'Connor, 1980. The notable records are indicated by arrows.



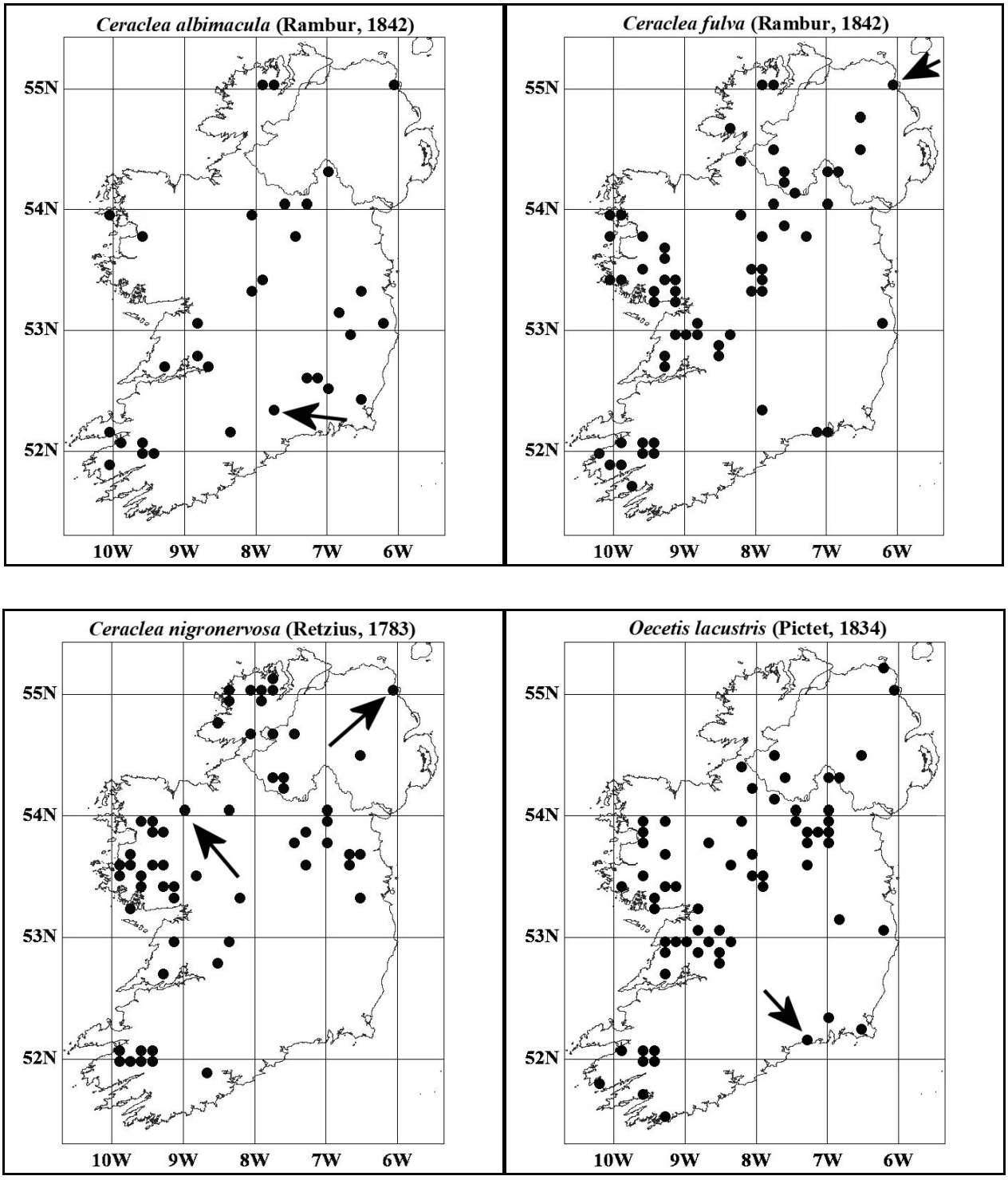
FIGURES 49-52. The known Irish distributions of *Limnephilus rhombicus* (Linnaeus, 1758), *Limnephilus stigma* Curtis, 1834, *Halesus digitatus* (Schrank, 1781) and *Halesus radiatus* (Curtis, 1834). The notable records are indicated by arrows.



FIGURES 53-56. The known Irish distributions of *Micropterna lateralis* (Stephens, 1837), *Micropterna sequax* McLachlan, 1875, *Potamophylax cingulatus* (Stephens, 1837) and *Potamophylax latipennis* (Curtis, 1834). The notable records are indicated by arrows.



FIGURES 57-60. The known Irish distributions of *Stenophylax permistus* McLachlan, 1895, *Berea maurus* (Curtis, 1834), *Beraeodes minutus* (Linnaeus, 1761) and *Odontocerum albicorne* (Scopoli, 1763). The notable records are indicated by arrows.



FIGURES 61-64. The known Irish distributions of *Ceraclea albimacula* (Rambur, 1842), *Ceraclea fulva* (Rambur, 1842), *Ceraclea nigronervosa* (Retzius, 1783) and *Oecetis lacustris* (Pictet, 1834). The notable records are indicated by arrows.

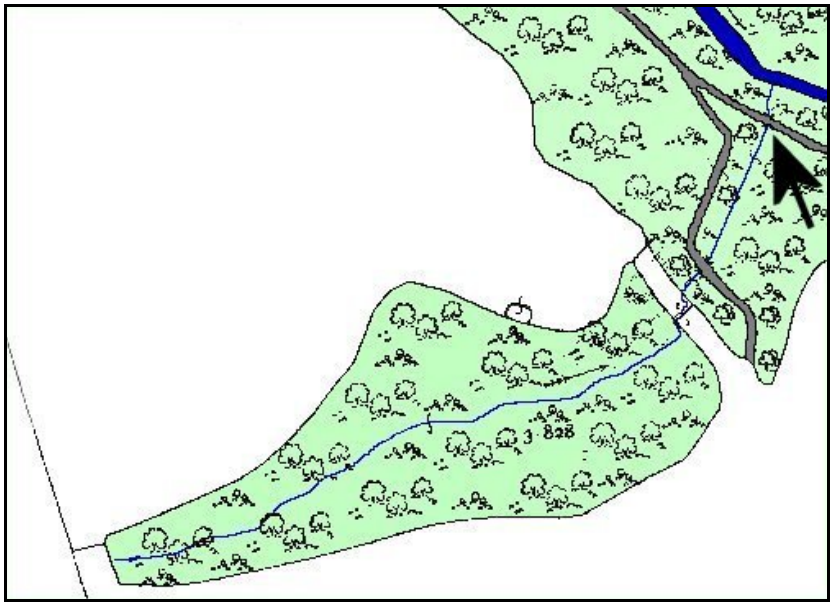


FIGURE 65. The stream where *Hydropsyche fulvipes* was collected at Edenvale, County Wexford, based on the 25 inch map (1883-1913) from the Ordnance Survey Ireland. The stream and the Sow River are in blue, the woodland in green and the paths in grey. The site of capture is indicated by an arrow.

PLATE 1. An aerial photograph of the woodland containing the stream at Edenvale, County Wexford, 2018. The gap in the woodland shown in Fig. 65 has become overgrown. Photograph © National Biodiversity Data Centre, Waterford.

PLATE 2. The stream in Oaklands (Kelly's) Wood, County Wexford where the second Irish specimen of *Hydropsyche fulvipes* was trapped. Photograph © M. A. O'Connor

PLATE 3. Galboly Lough, Garron Plateau, County Antrim, one of the new sites for *Limnephilus borealis*. Photograph © Cathal McNaughton.

PLATE 4. Pollardstown Fen, County Kildare where *Limnephilus pati* was found. Photograph © Catherine O'Connell, Irish Peatland Conservation Council <www.ipcc.ie.>.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

FIRST RECORD OF A STRANDED BLACK WALNUT *JUGLANS NIGRA* L. (JUGLANDACEAE: CARDIOCARYON) FROM IRISH WATERS AND A REVIEW OF NW EUROPEAN RECORDS

*Declan T. G. Quigley[1] and Dan Minchin[2]
[1]*Sea Fisheries Protection Authority, Eastern Region, West Pier, Howth, Co. Dublin, Ireland.*
[2]*Marine Organism Investigations, Ballina, Killaloe, Co. Clare, Ireland.*
*Corresponding author e-mail: <declan.quigley@sfpa.ie>

Abstract

On 13 September 1990, DM discovered a Black Walnut *Juglans nigra* L. measuring 25mm in length and 31mm in diameter stranded on Fanore Beach (M140080, 53.1173 ^{0}N, 9.2871 ^{0}W), County Clare, on the Atlantic coast of western Ireland. The specimen, which represents the first record of *J. nigra* from Irish waters and the 54th from NW Europe, was donated to the National Herbarium, Dublin (DBN: 2019). The occurrence of stranded Black Walnuts on NW European maritime shores is reviewed.

Key words: Black Walnut, *Juglans nigra*, stranded walnuts, Irish and NW European waters.

Introduction

At least twenty two extant species of walnut (*Juglans*) are currently recognised worldwide <www.theplantlist.org>. *Juglans* are deciduous, monoecious trees exhibiting a disjunct New and Old World distribution pattern ranging from temperate regions in North America southwards to tropical regions in Central and South America, and from temperate regions in south-eastern Europe, to eastern Asia and Japan (Manning, 1978; Aradhya *et al*., 2007). Walnut trees grow primarily in a humid temperate climate so that those found in tropical latitudes are restricted to rather high altitudes with good rainfall, while those found in arid regions are restricted to the canyons of streams (Manning, 1957).

At least eleven endemic species of *Juglans* are known to occur within hydrographic catchments draining into the North Western Atlantic Ocean, Gulf of Mexico, and Caribbean Sea: Black Walnut (*J. nigra* L.) (Eastern U.S.A.); White Walnut (*J. cinerea* L.) (SE Canada and eastern U.S.A.); Texas Walnut (*J. microcarpa* Berland) (SE U.S.A. and NE Mexico); Nogal Encarcelado (*J. hirsuta* W.E.Manning) (NE Mexico); Nuez Meca (*J. mollis* Engelm.) (NE Mexico); *J. pyriformis* Leibm. (SE Mexico); *J. steyermarkii* W.E.Manning (Guatemala); Cedro Negro (*J. olanchana* Standley & L.O.Williams) (Guatemala, Honduras, Nicaragua and Costa Rica); Andean Walnut (*J. neotropica* Diels) (Columbia and Venezuela); Nogal de Caracas (*J.

venezuelensis W.E.Manning) (Venezuela); and Jamacian Walnut (*J. jamaicensis* C. DC.) (Greater Antilles) (Manning, 1957, 1960, 1978; Grimshaw, 2003).

Several species of walnut, including *J. nigra, J. cinerea, J. regia,* Japanese Walnut (*J. ailantifolia* Carrière), Chinese Walnut (*J. cathayensis* Dode), and Manchurian Walnut (*J. mandshurica* Maxim.), have been introduced and are currently cultivated in NW Europe (Johnson and More, 2006; Van der Ham *et al*., 2014). A range of walnut tree species, including *J. nigra*, *J. cinerea*, *J. regia*, and *J. ailantifolia,* as well as several varieties and hybrids, are well established under ambient conditions in the National Botanic Gardens in Dublin (Anon., 2015).

J. nigra is endemic throughout eastern North America. It grows as far north as southern Minnesota, southern Wisconsin, southern Michigan, and Maine in the U.S.A. and Ontario in Canada. Its range then extends southwards to north-western Florida, Texas and New Mexico. Within this distribution the species does not occur in the Mississippi Valley and Delta regions. Some isolated populations are found within the eastern parts of the species range and in the Mid-west (Stritch, 2018). *J. nigra* is also found in northern California (Sullivan, 2005).

J. nigra is a large tree (up to 38m tall) with a lifespan of about 250 years. It grows slowly on wet bottomlands, dry ridges, and slopes and has a preference for rich deep, moist soils. It grows extremely well on deep loams and fertile alluvial deposits. The nuts are an important food source for both wildlife and humans, and are commercially harvested (Victory *et al.*, 2006; Michler *et al*., 2007; Stritch, 2018).

Black Walnuts *Juglans nigra* stranded on Irish and NW European maritime shores

On 13 September 1990, DM discovered a Black Walnut *Juglans nigra* measuring 25mm in length and 31mm in diameter stranded on Fanore Beach (M140080, 53.1173 ^{0}N, 9.2871 ^{0}W), County Clare, on the Atlantic coast of western Ireland (Plate 1). The specimen, which represents the first record of *J. nigra* from Irish waters and the 54th from NW Europe, was donated to the National Herbarium, Dublin (DBN: 2019).

Details of all known Black Walnuts stranded on NW European maritime shores are summarized in Table 1. A total of fifty four specimens have been recorded to date, including the Netherlands (39), France (10), U.K. (3), Jersey (1), and Ireland (1).

Discussion

Juglans nigra nuts are usually 30 to 40mm long, subglobose to globose, rarely ellipsoid, very deeply longitudinally grooved, the surface between the grooves coarsely warty (Manning, 1957; Gunn and Dennis, 1999; De Langhe, 2008; Perry and Dennis, 2010; Van der Ham, 2015).

The surface grooves on the Fanore specimen were heavily eroded, most likely due to physical abrasion whilst rolling about for an extended period of time, either along the bed of a freshwater

river and/or whilst stranded on maritime beach sand. Cadée *et al*. (2014) illustrated black walnuts from Zandvoort on the Dutch coast showing similar variability in wear. In laboratory experiments, Huber and Ferguson (1998) demonstrated the potential abrasive effects of fluvial transport on various species of diaspores, including *J. nigra*. Indeed, Ferguson (2000) remarked: "It would be interesting to know whether such abraded walnuts (*J. nigra*) are actually found by beachcombers, or whether, because of their buoyancy, they survive fluvial transport almost unscathed". Van der Ham (2015) cautioned that the potential effects of abrasion need to be considered in interpreting the identity of walnuts found in paleo-botanical contexts. An example of an unabraded specimen, which was recently (13 November 2018) found stranded at Dungeness, Kent, U.K. is shown in Plate 2.

Although walnuts are generally thought to be naturally dispersed by gravity and animals, and more recently by humans, they usually have good floatation properties, and some species may also be dispersed by water. However, walnuts are not completely waterproof because the sutures between the two halves of the nut eventually allow the penetration of both fresh and salt water, thus killing the seed. During flood conditions, some walnuts are inevitably carried down rivers and out to sea where they drift in ocean currents for various periods of time before either sinking or stranding.

The maximum reported floatation period for *J. nigra* nuts under test conditions in sea water is 6.5 years (Dennis, 2000). Various estimates have been made regarding the expected time interval for passive eastward long-range dispersal of drift objects from south-eastern U.S.A. to Western Europe, ranging from at least 14 to 18 months (Quigley *et al*., 2016 and references therein). Considering the long-term potential floatation properties of *J. nigra*, there is every reason to believe that the current specimen probably originated somewhere along the eastern coast of the U.S.A. or NE Canada and passively drifted *via* the Gulf Stream and North Atlantic Drift to western Ireland.

In the NW Atlantic, nuts belonging to *J. nigra*, *J. cinerea,* and the introduced and widely cultivated 'English' or 'Persian' walnut (*J. regia* L.) are not uncommonly found stranded on maritime beaches in the Caribbean and Gulf of Mexico, as far north as Delaware Bay on the east coast of the U.S.A. (Gunn, 1968; Gunn and Dennis, 1973, 1999; Gunn *et al*., 1984; Burkhalter and Wright, 1989; Zies, 1997; Perry and Dennis, 2010). However, stranded nuts belonging to *J. jamaicensis* have rarely been recorded from this region (Sullivan, 2003; Quigley *et al*., 2016). Stranded nuts of *J. nigra* have also been recorded on the Pacific coast of North America, from Queen Charlotte Island, Columbia, Canada southwards to San Francisco, California, U.S.A. (Ebbesmeyer, 1997).

Although stranded nuts belonging to *J. nigra*, *J. cinerea*, *J. regia*, *J. jamaicensis*, *J. ailantifolia*, and California Black Walnut (*J. californica* S.Watson), have been recorded from

NW European shores, only three off these species have been recorded from Irish waters: *J. nigra, J. cinerea* and *J. jamaicensis* (Quigley *et al.*, 2016; Quigley and Minchin, in press). While nuts belonging to *J. regia*, *J. ailantifolia*, and *J. californica* may have been locally discarded, those belonging to *J. nigra*, *J. cinerea* and *J. jamaicensis* probably represent true peregrine trans-Atlantic drifters. Cadée *et al.* (2014) considered that the vast majority of Black Walnuts found stranded on Dutch shores most likely represented true peregrine drifters and that the unusually high percentage (72%) of NW European records from this specific maritime region was propably due to concentrated recording effort. It is also possible that particularly strong, albeit intermittant influxes of North Atlantic water masses into the North Sea, may account for the occasional occurrence of unusually high numbers of trans-Atlantic disseminules and other NW Atlantic marine biota both within this region and other maritime regions of NW Europe.

Acknowledgements

We are grateful to the following for their help: Ed Perry (Melbourne Beach, Florida, U.S.A.) for confirming the identity of the current specimen, Chilekwa Chisala (Vlaams Instituut voor de Zee vzw Flanders Marine Institute, Oostende, Belgium) for sourcing references, Laura Urbonaviciene (SFPA, Howth) for providing images of the current specimen, and Andy Dinsdale (Fairlight, East Sussex, U.K.) for the images of the recent specimen from Dungeness.

References

Anon. (2015) National Botanic Gardens, Glasnevin. Far Grounds – *Aesculus, Betula* etc. (A4) Loc. 5. Last updated: April 2015.

Aradhya, M. K., Potter, D, Gao, F. and Simon, C. J. (2007) Molecular phylogeny of *Juglans* (Juglandaceae): a biogeographical perspective. *Tree Genetics and Genomes* **3**: 363-378.

Brochard, C. J. E. and Cadée, G. C. (2005) Tropische drijfzaden van de Nederlandse kust. *Tabellenserie van de Strandwerkgemeenschap* **30**: 1-66.

Burkhalter, J. R. and Wright, J. C. (1989) Fourteen additions to the known stranded seeds and fruits of northwest Florida beaches. *Sida* **13**: 345-349.

Cadée, G. C., Van der Ham, R. and Kruiswijk, W. (2014) Black walnuts from the Dutch coast. *The Drifting Seed* **20**: 6-7.

De Langhe, J. (2008) The Juglandaceae: *Carya* Nutt., *Cyclocarya* Iljinsk, *Juglans* L., *Platycarya* Siebold & Zucc., Pterocarya Kunth. Identification key to the species of the genera, based on vegetative features, from specimens in West-European collections. Ghent University Botanical Garden. 6 pp.

Dennis, J. V. (2000) The lucky bean. *The Drifting Seed* **6**: 8-9.

Ebbesmeyer, C. C. (1997) Seagoing black walnut endocarps. *The Drifting Seed* **3**: 8.

Ferguson, D. (2000) Scrapes with a black walnut. *The Drifting Seed* **6**: 11.

Grimshaw, J. M. (2003) *Juglans*, notes on the temperate species. *International Dendrology Society Yearbook*. pp 107-130.

Gunn, C. R. (1968) Stranded seeds and fruits from the southeastern shore of Florida. *Garden Journal* **18**: 43-54.

Gunn, C. R., Andrews, J. M. and Paradine, P. J. (1984) Stranded seeds and fruits from the Yucatan Peninsula. *Anales del Instituto de Biologia de la Universidad Nacional Autonoma de Mexico. Series Botanica* **53**: 21-60.

Gunn, C. R. and Dennis, J. V. (1973) Tropical and temperate stranded seeds and fruits from the Gulf of Mexico. *Contributions in Marine Science* **17**: 111-121.

Gunn, C. R. and Dennis, J. V. (1999) *World guide to tropical drift seeds and fruits*. Krieger Publishing Company, Malabar, Florida.

Huber, W. and Ferguson, D. K. (1998) On the abrasion of diaspores during fluvial transport: an experimental approach. *Review of Palaeobotany and Palynology* **102**: 305-311.

Jarzembowski, E. and Jarzembowski, B. (2008) The drifting seed in Sussex, southeast England. *The Drifting Seed* **14**: 15.

Johnson, O. and More, D. (2006) *Collins tree guide*. HarperCollins, London.

Le Sueur, F. (1987) Botany Section Report for 1986. *112th Annual Bulletin of Societe Jersiaise* **24**: 311.

Nelson, E. C. (2000) *Sea Beans and Nickar Nuts. A handbook of exotic seeds and fruits stranded on beaches in north-western Europe*. BSBI Handbook **Number 10**. Botanical Society of the British Isles, London. 156 pp.

Manning, W. E. (1957) The genus *Juglans* in Mexico and Central America. *Journal of the Arnold Arboretum* **38**: 121-150.

Manning, W. E. (1960) The genus *Juglans* in South America and West Indies. *Brittonia* **12**: 1-26.

Manning, W. E. (1978) The classification within the Juglandaceae. *Annals of the Missouri Botanical Garden* **65**: 1058-1087.

Michler, C. H., Woeste, K. E. and Pijut, P. M. (2007) Black walnut. *In* Kole, C. (ed.) *Forest Trees - Genome mapping and molecular breeding in plants* **7.** Springer, Berlin, Heidelberg.

Perry, E. and Dennis, J. V. (2010) *Sea-beans from the tropics: a collector's guide to sea-beans and other tropical drift on Atlantic shores*. Krieger Publishing Company, Malabar, Florida.

Quigley, D. T. G., Gainey, P. A., Moss, H. Judge, W., Venn, E. and Dinsdale, A. (2016) First records of Jamaican walnuts *Juglans jamaicensis* (Juglandaceae) from Irish and UK waters, together with observations on other walnut species reported from NW Europe. *New Journal of Botany* **6**: 102-108.

Quigley, D. T. G. and Minchin, D. (in press) First record of a stranded White Walnut or Butternut (*Juglans cinerea* L.) (Juglandaceae: Cardiocaryon) from Irish waters. *Irish Naturalists' Journal.*

Stritch, L. (2018) *Juglans nigra*. *The IUCN Red List of Threatened Species* 2018: e.T62019712A62019714. <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS. T62019712A62019714. en>. (accessed and downloaded 15 September 2019).

Sullivan, G. (2003) Sea-Bean Collection at University of Texas at Austin Marine Science Institute. *The Drifting Seed* **9**: 7-9.

Sullivan, G. (2005) California pignuts. *The Drifting Seed* **11**: 10-11.

Van der Ham, R. W. J. M. (2015) On the history of the butternuts (*Juglans* section *Cardiocaryon*, Juglandaceae). *Palaeontographica, AbteilungB: Palaeobotany – Palaeophytology* **293**: 125-147.

Van der Ham, R., Cadée, G. C. and Kruiswijk, W. (2013) Walnoten, pecannoten en een vieugelnoot van de Nederlandse kust. *Het Zeepaard* **73**: 96-103.

Van der Ham, R., Eurlings, M. and Van Den Wollenberg, B. (2014) Het walnootassortiment van de Botanische Tuin. *Papyrus* **1** (Spring 2014): 14-16.

Victory, E. R., Glaubitz, J. C., Rhodes, O. E. and Woeste, K. E. (2006) Genetic homogeneity in *Juglans nigra* (Juglandaceae) at nuclear microsatellites. *American Journal of Botany* **93**: 118-126.

Zies, P. (1997) Florida drift seeds. *The Drifting Seed* **3**: 6-7.

TABLE 1. NW European records of stranded Black Walnuts (*Juglans nigra*).

Date	Location	Latitude	Longitude	Numbers	Length (mm)	Diameter (mm)	Collector	Reference	Vouchers
17.03.1986	St Brelade's Bay, Jersey, Channel Islands	49.1854	2.2013	1			Francis Le Sueur	Le Sueur (1987); Nelson (2000)	DBN:1986.03.17
13.09.1990	Fanore Beach, Co Clare, Ireland	53.1173	-9.2871	1	25	31	Dan Minchin	This paper	DBN:2019
1995	Texel, Netherlands	53.0548	4.7977	1			Edwin van Egmond	Brochard & Cadee (2005)	
1999	Texel, Netherlands	53.0548	4.7977	1			Katja Philippart	Brochard & Cadee (2005)	
1999	Zandvoort aan Zee, Netherlands	52.3711	4.5334	1			Wim Kniswijk	Brochard & Cadee (2005)	
c.1999	Westkapelle, Netherlands	51.5293	3.4406	1				Van der Ham *et al.* (2013)	
1999-2012	Zandvoort aan Zee, Netherlands	52.3711	4.5334	25	22.8-35.3 (28.9)	27.3-37.1 (31.5)	Wim Kniswijk	Van der Ham *et al.* (2013); Cadee *et al.* (2014)	
2000	Zandvoort aan Zee, Netherlands	52.3711	4.5334	1			Wim Kniswijk	Brochard & Cadee (2005)	
February 2001	Bretignolles sur Mer, Vendee, France	46.6275	-1.8574	2			Christophe Brochard	Brochard & Cadee (2003, 2005)	
2002	Zandvoort aan Zee, Netherlands	52.3711	4.5334	1			Wim Kniswijk	Brochard & Cadee (2005)	
2005	Bergen aan Zee, Netherlands	52.6610	4.6318	1				Van der Ham *et al.* (2013)	
Winter 2005	Tide Mills Beach, N Seaford, E Sussex, UK	50.7829	0.0706	1	28	28	Ed Jarzembowski	Jarzembowski & Jarzembowski (2008)	
2006	Texel, Netherlands	53.0548	4.7977	1				Van der Ham *et al.* (2013)	
2007	Castricum, Netherlands	52.5453	4.6727	1				Van der Ham *et al.* (2013)	
2010	Monster, Netherlands	52.0240	4.1731	1				Van der Ham *et al.* (2013)	
2012	Maasvlakte, nr. Rotterdam, Netherlands	51.9633	4.0311	2				Van der Ham *et al.* (2013)	
2012	Bretignolles sur Mer, Vendee, France	46.6275	-1.8574	4			Christophe Brochard	Van der Ham *et al.* (2013)	
2013	Gorssel, Ijssel, Netherlands	52.2014	6.2011	2			Wim J. Kuijper	Van der Ham *et al.* (2013); Cadee *et al.* (2014)	
April 2013	Bretignolles sur Mer, Vendee, France	46.6275	-1.8574	4			Christophe Brochard	Van der Ham *et al.* (2013); Cadee *et al.* (2014)	
28.05.2016	Dungeness, Kent, UK	50.9175	0.8939	1	31	33	Andy Dinsdale	Quigley et al. (2016)	
13.11.2018	Dungeness, Kent, UK	50.9175	0.8939	1			Andy Dinsdale	This paper	

PLATE 1. Black Walnut (*Juglans nigra)* stranded on Fanore Beach, County Clare (13 September 1990). From left to right: apical, basal and lateral views. Photograph © Laura Urbonaviciene.

PLATE 2. Black Walnut (*Juglans nigra*) stranded at Dungeness, Kent, U.K. (13 November 2018). Left to right: lateral and apical views. Photographs © Andy Dinsdale.

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

VALIDATION OF THE FOSSIL GENUS NAME †*ACUTIFORCIPIA* (DIPTERA: CHIRONOMIDAE: ORTHOCLADIINAE)

Patrick Ashe[1] and James P. O'Connor[2]
[1]*33 Shelton Drive, Terenure, Dublin 12, D12 PK68, Ireland.*
e-mail: <patrick.ashe1983@gmail.com>
[2]*Emeritus Entomologist, National Museum of Ireland – Natural History, Merrion Street, Dublin 2, Ireland.*

Abstract

The name †*Acutiforcipia* (with three included species) has been an unavailable nomen nudum since its original description in 2009 because a type-species was not designated. †*Acutiforcipia* is validated here by designating a type-species.

Introduction

A World Catalogue on Chironomidae is currently being compiled of which the first two volumes are published (Ashe and O'Connor 2009, 2012) and two more volumes are expected (Volume 3 on the Subfamily Chironominae and Volume 4 dealing with all the described fossil Chironomidae). The manuscript for volume 4 is nearing completion and is expected to be published in early 2020. We therefore take this opportunity to validate the name †*Acutiforcipia* prior to volume 4 being published.

Validation of the genus name †ACUTIFORCIPIA

Seredszus and Wichard in Wichard *et al*. (2009: 244-245) proposed a new fossil genus (†*Acutiforcipia*) with three included species (*A. cuspilonga*, *A. crusnotabile* and *A. fittkaui*). However, the name †*Acutiforcipia* was not made available because it was not accompanied by fixation of a type-species contrary to Article 13.3 of the Zoological Code (ICZN, 1999, 4th Edition). Therefore, †*Acutiforcipia* in Wichard *et al*. (2009) is an unavailable **nomen nudum**, whereas the names of the three included species proposed in the same work were made available there. We would have been glad to validate the genus name with its initial authorship (Seredszus and Wichard), but such action is ruled out in this case by the wording of Code Article 50.1.1 (M. Spies pers. comm.).

The name †*Acutiforcipia* is validated below, with the taxonomic diagnosis as given in Wichard *et al*. (2009: 244-245), by designating a type-species. We have decided to select *A. cuspilonga* as the type-species, because it was the first of the three species described by Seredszus and Wichard in Wichard *et al*. (2009), and because it was based on more type material (a holotype and two

paratypes) than the other two species.

Genus †**ACUTIFORCIPIA n. gen.**

†**ACUTIFORCIPIA** ASHE & O'CONNOR, 2019: *Bulletin of the Irish Biogeographical Society* **43**: 132. Type-species: *Acutiforcipia cuspilonga* Seredszus & Wichard in Wichard, Gröhn & Seredszus, 2009, by present designation.

Acknowledgement

The authors are very grateful to Martin Spies, Zoologische Staatssammlung, Munich, Germany, for his assistance with the wording of the validation.

References

Ashe, P. and O'Connor, J. P. (2009) *A World Catalogue of Chironomidae (Diptera). Part 1. Buchonomyiinae, Chilenomyiinae, Podonominae, Aphroteniinae, Tanypodinae, Usambaromyiinae, Diamesinae, Prodiamesinae and Telmatogetoninae*. Irish Biogeographical Society & National Museum of Ireland, Dublin. 445 pp.

Ashe, P. and O'Connor, J. P. (2012) *A World Catalogue of Chironomidae (Diptera). Part 2. Orthocladiinae*. Irish Biogeographical Society & National Museum of Ireland, Dublin. 968 pp.

ICZN (1999) *International Code of Zoological Nomenclature*. *Fourth Edition.* International Trust for Zoological Nomenclature, London. xxix + 306 pp.

Wichard, W., Gröhn, C. and Seredszus, F. (2009) *Wasserinsekten im Baltischen Bernstein - Aquatic insects in Baltic Amber*. Verlag Kessel, Remagen-Oberwinter. 336 pp. [Bilingual, in German and English]

Bulletin of the Irish Biogeographical Society **Number 43** (2019)

WINTER ACTIVITY OF ROVE BEETLES (COLEOPTERA: STAPHYLINIDAE) IN FIELDS AND FIELD MARGINS IN IRELAND AND DENMARK

Jervis A. Good
Glinny, Riverstick, Co. Cork, Ireland.
e-mail: <*Pygidicrana@mail.com*>

Abstract

Winter-active staphylinid beetles recorded from fields and field margins are reported: from a recently sown wheat field in County Cork (Ireland) sampled by D-vac suction sampler in November; from a wheat field, grass strip and field margin sampled by pitfall traps in December near Copenhagen (Denmark); and from an old sheep pasture in County Cork (Ireland) sampled by pitfall traps in January. Differences in relative abundance of the closely related *Atheta* (*Mocyta*) *fungi* (Gravenhorst) and *A.* (*M.*) *amplicollis* (Mulsant & Rey) are discussed. The winter-active species *Acidota cruentata* Mannerheim is recorded from County Cork.

Key words: Coleoptera, Staphylinidae, Carabidae, overwintering arthropods, field margins, *Atheta amplicollis*, *Mocyta*.

Introduction

Many species of staphylinid beetle occur in cultivated land and agricultural grassland, including a number which are significant predators and parasitoids of crop and grass pests. Heydemann (1956) was the first to thoroughly study winter activity of staphylinid beetles in cultivated land. However, few subsequent studies of overwintering staphylinids in cultivated soils have identified all staphylinids to species, or presented complete species data, and this especially applies to the genus *Atheta*. Three data sets on the winter activity of staphylinid beetles in fields and their grass margins from Ireland and Denmark are reported, with special reference to the *Atheta fungi* species-group.

Methods

The following three sites, two in Ireland and one in Denmark, were sampled for adult Staphylinidae:

(1). Lackaleigh, near Kanturk, County Cork (Ireland) (Irish grid reference R424035), 2 November 1985. D-vac suction sampler (Dietrick, 1961), recently emerged wheat (sown 20 September 1985) in *circa* 10ha winter wheat field, on a loam soil. Samples were collected in 24 areas of the field (total 116m^2 sampled), from 12:30 to 16:30 (GMT) during calm, sunny, dry, cool (air temp. 4-5^{0}C) conditions; the soil surface was dry, but moist several mm deep.

(2). Glinny (near Riverstick), County Cork (Ireland) (Irish grid reference W668590), 2 - 22

January 1985, *circa* 1ha old pasture grazed by sheep. Ten pitfall traps (plastic cups with ethylene glycol preservative) in a line at 2m intervals in:

(2a) Field centre;

(2b) Field margin adjacent to hedgebank.

Also, from this site, eight sieve samples with subsequent Tullgren funnel extraction, of moss growing at the base of a stone-faced hedgebank with *Ulex/Rubus* scrub, 2 January 1985.

(3). Cathrineberg (near Tåstrup), Copenhagen (Denmark), 11-18 December 1989. Pitfall traps, autumn-sown winter wheat on sandy soil. Six glass pitfall traps (diameter 37mm) with ethylene glycol preservative were placed in each of the following parts of the 65ha field:

(3a).Centre of wheat field (*circa* 90m from field margin) (UTM grid reference 28U 6733 61757);

(3b) Field margin (cultivated soil 0.5m from edge of a spruce-dominated plantation (*Picea abies* (L.)) (UTM grid reference 28U 6732 61756);

(3c) Field margin (cultivated soil 0.5m from edge of a disused chalk pit) (UTM grid reference 28U 6735 61759);

(3d) Field margin near grass strip (cultivated soil 0.5m from edge of a grass strip (see (e) below) (UTM grid reference 28U 6733 61755);

(3e) Grass strip (1m width, containing *Dactylis glomerata* L. and *Festuca rubra* L., planted as a refuge for predatory arthropods in the spring of 1988) (UTM grid reference 28U 6733 61755).

Ocalea badia (Erichson) was determined using keys and figures in Hansen (1954), Lohse (1974), Palm (1972) and Assing and Terlutter (2008). Parthenogenetic *Atheta fungi* (Gravenhorst) were separated from ♀ *A. amplicollis* (Mulsant & Rey) by several external characters (Benick and Lohse, 1974), including the relative size and shape of the spermatheca, and the shape of the penultimate antennal segment (subquadrate to transverse in *A. fungi* and slightly longer than broad in *A. amplicollis*). The illustrations and descriptions of these species in Dr Viggo Mahler's unpublished thesis (the author's copy of which is currently on loan to the Natural History Museum in London) were used to aid their identification, with reference specimens kindly given by Dr Mahler. Nomenclature follows Löbl and Löbl (2015) for Staphylinidae, and Luff (2007) for Carabidae.

Results

Near Tåstrup (Table 1), only four species were recorded in the field centre, two of which (*Lesteva longoelytrata* (Goeze) and *Tachinus fimetarius* Gravenhorst) were abundant. *L. longoelytrata* and *T. fimetarius* also occurred abundantly in the field margins and the grass strip; *Aloconota gregaria* (Erichson) was less abundant but still active in numbers in the field margins and grass strip; *Liogluta alpestris* (Heer) occurred in numbers only in the grass strip.

Activity in the newly cultivated wheat field near Kanturk in early November was limited to 14 species of Staphylinidae (and four of Carabidae), of which four species occurred frequently (Table 2).

Near Riverstick, a total of seven species were recorded as active in the sheep pasture in January, with many other species recorded hibernating in moss at the field boundary (Table 3).

No winter activity was recorded in either *Atheta amplicollis* or *A. fungi* from pitfall traps in either the Tåstrup or Riverstick sites (Tables 1 and 3), but they were recorded in bank moss at the Riverstick site (Table 3). Both species also occurred in early November D-vac samples at the Kanturk site, where more *A. amplicollis* occurred in the suction samples than *A. fungi* (40 cf. 13, Table 2).

Acidota cruentata Mannerheim was recorded in the old sheep pasture near Riverstick (County Cork) (both field centre and margin) (Table 3), as well as in a field margin near Tåstrup (Denmark) (Table 1). *Ocalea badia* was active in the grass strip near Tåstrup, as shown by the capture of three individuals in pitfall traps (Table 1).

Discussion

A few species were abundant at the two cultivated sites, but there were no abundant species in the pasture in January (Tables 1-3).

Winter-active Staphylinidae

In general, the winter-active staphylinid fauna from the Danish site was similar to that observed in Schleswig-Holstein, Germany, by Heydemann (1956), although he also recorded *Mycetoporus baudueri* Mulsant & Rey, *Omalium caesum* Gravenhorst and *O. rivulare* (Paykull) as common species. *Lesteva longoelytrata*, one of the abundant species near Tåstrup (Table 1), was recorded as common in winter wheat and barley fields during winter, in Schleswig-Holstein (Heydemann, 1956; Hossfeld, 1963), northern England (Purvis, Carter and Powell, 1988), and in southern Ireland (Table 2; also near Riverstick, County Cork, J. A. Good, unpublished). *Tachinus fimetarius*, a species not known from Great Britain or Ireland, and which occurred abundantly near Tåstrup, was also similarly found in great numbers in wheat fields with sandy soils in winter in Schleswig-Holstein (Heydemann, 1956), although Hossfeld (1963) also recorded it as abundant in medium-textured soils.

The only abundant species recorded from the Irish cultivated soil site were species of the *Atheta fungi* group. Both Heydemann (1956) and Hossfeld (1963) refer to the genus *Atheta* being common, but at that time *Atheta* included *Aloconota* (Hansen, 1954), so it could be *Aloconota gregaria* that was numerous, which correlates with the Tåstrup results (Table 1).

Atheta amplicollis* and *A. fungi

Atheta fungi sensu lato (*s.l.*) is one of the most abundant beetles in agricultural land in north-west Europe. However, the taxonomy of the *Atheta fungi* group is not settled, and where *A. fungi* is cited in ecological studies (which is not often), it is rarely separated from the closely related *A. amplicollis*.

A. fungi is recognised as having parthenogenetic populations (Korge, 1975; Topp, 1975; Josefsen, 2014; Klimaszewski *et al*., 2015), but many authors treat *A. fungi* as including males in their population (e.g. Palm, 1970; Topp, 1975; Outerelo, Gamarra and Aranda, 2001). However, Mahler (1987) stated that *A. fungi* is parthenogenetic in Denmark, with over 20,000 Danish specimens examined all being female. He concluded that the only certain *A. fungi* males were restricted to northern Scandinavia, Iceland and the Nearctic (Mahler, 1987), and (pers. comm., 1988) that of the *A. fungi* male aedeagi illustrated by Brundin (1952), Fig. 63 (Lappland, Sweden) was *fungi*, but Fig. 62 (Surrey, England) was *amplicollis*. He was of the opinion (pers. comm., 1988) that Topp (1975) included *A. amplicollis* within his concept of *A. fungi*, hence the occurrence of 2% ♂♂ in the population sampled by Topp. Also Lohse and Smetana (1985) considered *A. fungi* to be parthenogenetic, and Josefsen (2014) stated that the Norwegian *A. fungi* was apparently mainly parthenogenetic, and, according to Klimaszewski *et al*. (2015), only parthenogenetic populations occur in North America.

Ideally, the concept of *A. amplicollis* would be based on re-examination of the type specimen(s). *A.* (*M.*) *amplicollis* was described (albeit provisionally) as *Colpodota amplicollis* by Mulsant & Rey in 1873. Although the Rey Collection (in the Museum d'Histoire Naturelle de Lyons) is in excellent condition (Muona, 1979), the type of *amplicollis* could not be located (Kevan, 1966). However, Kevan (1966) pointed out that *amplicollis* was "... originally separated as *A. fungi* var '*e*'...", and there remains a slight possibility that the type may be labelled '*fungi* var e' rather than '*amplicollis'*, and consequently overlooked.

From material collected by this author, it appears that only parthenogentic *A. fungi* occurs in cereal fields and agricultural grasslands in Ireland, and sexual individuals are *A. amplicollis*. Moore (1981) cited P. M. Hammond as stating that *A. amplicollis* is "very common in Britain and Ireland (Hammond, pers. comm.)", which corresponds to the concept of both species, as interpreted here, regularly occurring together. However, while *A. fungi* has been recorded in abundance in some habitats compared to *A. amplicollis* (e.g. Good, 2011 (Table 3); Honěk, Kocian and Martinková, 2012 (Table 1)), the reverse (*A. amplicollis* abundant with few *A. fungi*) has rarely been reported. It is interesting, then, that there were greater numbers of *A. amplicollis* (40) than *A. fungi* (13) in the D-vac samples from the newly-sown crop (near Kanturk) (Table 2). Dominance of *A. amplicollis* also occurred at two other Irish sites, one a marly turlough (Roo, County Clare) with a ratio of *A. amplicollis/A. fungi* of 12/0 (Good and Butler, 2001), and the other a metalliferous tailings grassland with a ratio of 60/8 (Good, 1999).

If there is anything in common between the Kanturk, Roo and Tynagh samples, it is perhaps the lack of freshly-decomposing, nutrient-rich, grass vegetation with associated decomposer fungi and algae. The site near Kanturk was a recently re-sown field, with very little freshly decomposing leaves; Roo was a nutrient poor mossy marly turlough; and Tynagh was a metallophyte *Festuca rubra* sward which may have inhibited fungal or algal growth due to the elevated metal content of the plant tissue.

One observation, made by the author in July 1990 (at Lyons Estate, County Kildare), was the abundance of *A. fungi* in a set of pitfall traps baited solely with freshly-cut lawnmower grass (i.e. without preservative); but no *A. amplicollis* were recorded. This may further indicate that *A. fungi* has an association with freshly decomposing grass with extensive mould growth, compared to *A. amplicollis*. In recently cultivated soil, where any decomposing grass vegetation is buried by ploughing, fewer *A. fungi* would be predicted by such a hypothesis, as observed at the Kanturk site.

A. fungi (*s.l.*) was recorded as active (in pitfall traps) in winter rye in November in Schleswig-Holstein (Topp and Trittelvitz, 1980), similar to D-vac data reported here, but otherwise published data (Table 4) do not have sufficient taxonomic or temporal detail to indicate winter activity later than November. In winter (December and January), no activity of either of these species was recorded from crop field or pasture in either Denmark or Ireland, respectively (Tables 1 and 3). No individuals of *Atheta* (or of any staphylinid) were captured in two sets of D-vac suction samples of a winter wheat field near Kinsale, County Cork (Ireland) on 30 December 1984, taken between 03:20 and 04:20 GMT during mild (8^{o}C), calm, foggy weather (JAG, unpublished data). Lack of activity of *A. fungi* during winter was also recorded by Heydemann (1962: Fig. 88), Topp (1975), and Janssens and De Clercq (1985). Although *A. fungi* s.l. was recorded in flight over the pasture field near Riverstick on 21 October 1985 (Good, 2018), taking into account the temperatures from November (the highest air temperature recorded at Cork Airport during November 1985 was 13^{o}C (CSO, 2019)), it is unlikely that *Atheta amplicollis* would have emigrated out of the field by flight before winter. Consequently, *A. amplicollis* may be more likely to have overwintered in the field soil. Topp (1975) observed that a small proportion of *A. fungi* (*s.l.*) overwintered in the deeper layers of field soil.

Topp (1975) observed distinct differences in the length of the refractory period (time to ovarian development after favourable conditions resume) at the end of winter diapause in *Atheta fungi* (*s.l.*), i.e. including some *A. amplicollis*). The question could be asked as to whether this represented an ecophysiological difference between the two species. However, such variation in the refractory period can be explained as a bet-hedging strategy *within a population* in an unpredictable environment (Ślusarczyk *et al*., 2019), and may not therefore be attributable to an ecophysiological difference *between species*. Differences in the timing of diapause induction between the two species might explain the greater numbers of *A. amplicollis* recorded near

Kanturk, but a simple alternative hypothesis is that the recently cultivated field provided less suitable habitat for *A. fungi*.

Further data on the relative occurrence of these two species in early winter would be desirable to test any hypothesis of habitat difference.

Rarely-recorded species

There appears to be only one previous published Irish record of *Acidota cruentata*, from Murlough Nature Reserve in County Down (Hammond, 1980; Anderson, Nash and O'Connor, 1997). Adults of this species are only active in winter (Horion, 1963), which may indicate that it is under-recorded (Hyman and Parsons, 1994). It may be associated with nests and runs of small mammals such as field mice (Hansen, 1951; Horion, 1963), but it has been recorded as winter active in wheat fields in the Czech Republic also (Boháč and Pospišíl, 1985). The field where *A. cruentata* was recorded in south Cork was an old sheep-grazed pasture which has since been ploughed and reseeded for silage crops and grazing. However, *A. cruentata* was recorded in a cultivated wheat field margin near a wetland near Tåstrup, and it is likely to have survived near Riverstick, where there are areas of field margins adjoining woodlands and wetlands in the surrounding landscape.

While *Ocalea badia* is not rare in Denmark, it has not been frequently reported as winter-active. *O. badia* is a wetland species, which probably originated from the flooded chalk pits adjacent to the field near Tåstrup (Table 1). The occurrence of non-field species such as this indicates a role of grass margins as wintering refuges for habitats other than cultivated land.

Acknowledgements

Without the involvement of Dr Niels Elmegaard, of the then National Environmental Research Institute (Ministry of the Environment), Copenhagen, the Danish work would not have occurred; I am particularly grateful for his kind hospitality and collaboration with fieldwork, and also particularly grateful to Dr Viggo Mahler (Århus) for examining specimens of *Atheta amplicollis*, donating a reference pair of these species, and for allowing a copy to be made of his thesis on *Acrotona*. The work near Kanturk was carried out as part of a studentship in the Department of Zoology, University College Cork; that at Copenhagen as part of post-doctoral research at the Department of Agricultural Zoology and Genetics, University College Dublin. Both the above were funded by the then Department of Education. I would also like to thank Professor Paul Giller and Professor Jim Curry, respectively, for the use of the facilities of the above Departments, John O'Connell for assistance with fieldwork at the Kanturk site, Dr Fidelma Butler for comments on the manuscript, and Billy Coleman and the Cathrineberg Estate for permission to sample their fields.

References

Anderson, R., Nash, R. and O'Connor, J. P. (1997) Irish Coleoptera: a revised and annotated list. *Irish Naturalist's Journal* (Special Entomological Supplement 1997): 1-81.

Assing, V. and Terlutter, H. (2008) A new species of *Ocalea* from Romania (Coleoptera: Staphylinidae: Aleocharinae). *Linzer biologische Beiträge* **40**: 1337-1340.

Benick, G. and Lohse, G. A. (1974) Tribus 14 (Callicerini). Pp 72-220. *In* Freude, H., Harde, K. W. and Lohse, G.A. (eds) *Die Käfer Mitteleuropas*. **5**. *Staphylinidae II (Hypocyphtinae und Aleocharinae), Pselaphidae*. Goecke and Evers, Krefeld.

Boháč, J. and Pospíšil, J. (1985) Ground (Coleoptera, Carabidae) and rove (Coleoptera, Staphylinidae) beetles of wheat and corn fields and their interaction with surrounding biotopes. *Soviet Journal of Ecology* **3**: 120-130.

Brundin, L. (1952) *Acrotona*-Studien (Gattung *Atheta*, Col., Staphylinidae). *Entomologisk Tidskrift* **73**: 93-145.

CSO (2019) *Climate. Temperature by month, meteorological weather station and statistic (1958M01-2019M08).* Central Statistics Office, Cork.

D'Hulster, M. and Desender, K. (1984) Ecological and faunal studies of Coleoptera in agricultural land. IV. Hibernation of Staphylinidae in agro-ecosystems. *Pedobiologia* **26**: 65-73.

Dietrick, E.J. (1961) An improved backpack motor fan for suction sampling of insect populations. *Journal of Economic Entomology* **54**: 394-395.

Frank, T. and Reichhart, B. (2004) Staphylinidae and Carabidae overwintering in wheat and sown wildflower areas of different age. *Bulletin of Entomological Research* **94**: 209-217.

Good, J. A. (1999) Recolonisation by Staphylinidae (Coleoptera) of old metalliferous tailings and mine soils in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy* **99B**: 27-35.

Good, J. A. (2011) Dispersal and colonization by rove-beetles (Coleoptera: Staphylinidae) at a mine tailings grassland near Navan, Co. Meath, Ireland. *Bulletin of the Irish Biogeographical Society* **35**: 113-129.

Good, J. A. (2018) Rove beetles (Coleoptera: Staphylinidae) collected by an 'autocatcher' near Clonmacnoise (County Offaly) and Killarney (County Kerry), Ireland. *Bulletin of the Irish Biogeographical Society* **42**: 173-187.

Good, J. A. and Butler, F. T. (2001) Turlough pastures as a habitat for Staphylinidae and Carabidae (Coleoptera) in south-east Galway and North Clare, Ireland. *Bulletin of the Irish Biogeographical Society* **25**: 74-94.

Hammond, P. M. (1980) Staphylinidae (Coleoptera) in Ireland, 1: Micropeplinae, Proteininae, Omaliinae and Piestinae. *Irish Naturalists' Journal* **20**: 133-140.

Hansen, V. (1951) Biller XV. Rovbiller 1. *Danmarks Fauna* 57.

Hansen, V. (1954) Biller XVII. Rovbiller 3. *Danmarks Fauna* 59.

Heydemann, B. (1956) Untersuchungen über die Winteraktivität von Staphyliniden auf Feldern. *Entomologische Blätter* **52**: 138-150.

Heydemann, B. (1962) Die biozönotische Entwicklung vom Vorland zum Koog. II. Käfer (Coleoptera). *Abhandlungen der Mathematisch-Naturwissenschaftlichen Klasse Jahrgang 1962* **No. 11**: 173-370.

Honěk, A., Kocian, M. and Martinková, Z. (2012) Rove beetles (Coleoptera: Staphylinidae) in an apple orchard. *Plant Protection Science* **48**: 116-122.

Horion, A. (1963) *Faunistik der Mitteleuropäischen Käfer*. **IX**. *Staphylinidae 1, Micropeplinae bis Euaesthetinae*. Feyel, Überlingen-Bodensee.

Hossfeld, R. (1963) Synökologie Vergleich der Fauna von Winter-und Sommerrapsfeldern. *Zeitschrift für angewandte Entomologie* **52**: 209-254.

Hyman, P. S. and Parsons, M. S. (1994) *A review of the scarce and threatened Coleoptera of Great Britain. Part 2*. UK Nature Conservation **No. 12**, Joint Nature Conservation Commitee, Peterborough.

Janssens, J. and De Clercq, R. (1985) Seasonal activity of the dominant and subdominant Staphylinidae of arable land in Belgium. *Mededelingen van de Faculteit Landbouwwetenschappen, Rjksuniversiteit Gent* **50**: 511-518.

Josefsen, E. B. (2014) *Testing species boundaries in the staphylinid beetle genus* Mocyta *(Insecta, Coleoptera, Staphylinidae)*. M.Sc. thesis, University of Oslo.

Kelly, M. and Curry, J. P. (1985) Studies on the arthropod fauna of a winter wheat crop and its response to the pesticide methiocarb. *Pedobiologia* **28**: 413-421.

Kevan, D. K. (1966) *Atheta* (*Acrotona*) *amplicollis* (Mulsant & Rey) (Col., Staphylinidae) new to the British list. *Entomologist's Monthly Magazine* **101**: 122-124.

Klimaszewski, J., Webster, R. P., Bourdon, C., Pelletier, G., Godin, B. and Langor, D. W. (2015) Review of Canadian species of the genus *Mocyta* Mulsant & Rey (Coleoptera, Staphylinidae, Aleocharinae), with the description of a new species and a new synonymy. *ZooKeys* **487**: 111-139.

Korge, H. (1975) Untersuchungen einer parthenogenetischen Population von *Atheta fungi* (Gravenhorst 1806). *Entomologische Blätter* **71**: 165-172.

Löbl, I. and Löbl, D. (eds) (2015) *Catalogue of Palaearctic Coleoptera*. **2**. *Hydrophiloidea – Staphylinoidea*. Brill, Leiden. 2nd edition.

Lohse, G. A. (1974) Tribus 15 - 19 (Schistogenini - Aleocharinae). Pp 221-292. *In* Freude, H., Harde, K. W. and Lohse, G. A. (eds). *Die Käfer Mitteleuropas*. **5**. *Staphylinidae II*. Goecke and Evers, Krefeld.

Lohse, G. A. and Smetana, A. (1985) Revision of the types of species of Oxypodini and Athetini (*sensu* Seevers) described by Mannerheim and Mäklin from North America (Coleoptera: Staphylinidae). *Coleopterists Bulletin* **39**: 281-300.

Luff, M. L. (2007) The Carabidae (ground beetles) of Britain and Ireland. 2nd edition. *Handbooks for the Identification of British Insects* **4** (2): 1-247.

Mahler, V. (1987) Sjette tillæg til "Fortegnelse over Danmarks biller" (Coleoptera). *Entomologiske Meddelelser* **54**: 181-235.

Moore, R. (1981) A list of beetles from Sherkin Island taken in autumn 1980, including some new records for Cork and Munster. *Journal of Sherkin Island* **2**: 86-92.

Mulsant, E. and Rey, C. (1873) *Histoire naturelle des coléoptères de France. Brévipennes. Aleochariens.* Suite. Deyrolle, Paris.

Muona, J. (1979) The Aleocharine types of Mulsant & Rey (Coleoptera, Staphylinidae) I. *Annales Entomologica Fennica* **45**: 47-58.

Outerelo, R., Gamarra, P. and Aranda, A. (2001) Los Staphylinidae (Coleoptera) del Parque Nacional de las Tabla de Daimiel, Ciudad Real (España). *Ecología* **15**: 243-268.

Palm, T. (1970) Skalbaggar Coleoptera. Kortvingar: Fam. Staphylinidae. Underfam. Aleocharinae (*Atheta*). *Svensk Insektfauna* **No. 52**: 117-296.

Palm, T. (1972) Skalbaggar, Coleoptera. Kortvingar: Staphylinidae. Underfam. Aleocharinae (*Aleuonota - Tinotus*). *Svensk Insektfauna* **No. 53**: 301-467.

Pfiffner, L. and Luka, H. (2000) Overwintering of arthropods in soils of arable fields and adjacent semi-natural habitats. *Agriculture, Ecosystems and Environment* **78**: 215-222.

Purvis, G., Carter, N. and Powell, W. (1988) Observations on the effects of an autumn application of a pyrethroid insecticide on non-target predatory species in winter cereals. Pp 153-166. *In* Cavalloro, R. and Sunderland, K. D. (eds) *Integrated crop protection in cereals*. A. A. Balkema, Rotterdam.

Ślusarczyk, M., Chlebicki, W., Pijanowska, J. and Radzikowski, J. (2019) The role of the refractory period in diapause length determination in a freshwater crustacean. *Nature Scientific Reports* **9**: 11905.

Sotherton, N.W. (1984) The distribution and abundance of predatory arthropods overwintering on farmland. *Annals of Applied Biology* **105**: 423-429.

Topp, W. (1975) Morphologische Variabilität, Diapause und Entwicklung von *Atheta fungi* (Grav.) (Col., Staphylinidae). *Zoologische Jahrbuch. Abteilung für Systematik Ökologie und Geographie der Tiere* **102**: 101-127.

Topp, W. and Trittelvitz, W. (1980) Verteilung und Ausbreitung der epigäischen Arthropoden in der Agrarlandschaft. *Anzeiger der Schädlingskunde, Pflanzenschutz, Umweltschutz* **53**: 33-36.

TABLE 1. Adult rove-beetles (Staphylinidae) in pitfall trap samples from a winter wheat field after wheat emergence at Cathrineberg (near Tåstrup), Copenhagen, Denmark, during December 1989. Field mar 1 = field margin near woodland; Field mar 2 = field margin near chalk pit.

Species	*Field centre*	*Field mar 1*	*Field mar 2*	*Crop near grass strip*	*Grass strip*
Acidota cruentata Mannerheim	-	-	1	-	-
Aloconota gregaria (Erichson)	-	18	7	-	6
Atheta gramincola (Gravenhorst)	1	-	-	-	-
Lesteva longoelytrata (Goeze)	54	10	21	26	25
Liogluta alpestris (Heer)	1	-	-	1	10
Ischnosoma splendidum (Gravenhorst)	-	-	1	-	-
Quedius boops-complex*	-	-	1	-	1
Tachinus fimetarius Gravenhorst	34	10	6	33	71
Ocalea badia (Erichson)	-	-	-	-	3
Omalium caesum Gravenhorst	-	-	-	-	1
Oxypoda opaca (Gravenhorst)	-	-	-	-	1
Tachinus corticinus Gravenhorst	-	-	-	-	1
Tachyporus nitidulus (Fabricius)	-	-	-	-	1
Tachyporus pusillus Gravenhorst	-	-	-	-	1
Xantholinus linearis (Olivier)	-	-	-	-	2
Xantholinus longiventris Heer	-	-	-	-	1

(* A ♂, determined as *Quedius boopoides* Munster, was recorded from a field margin 2 trap; a ♀, which could not be determined to species, was recorded from the grass strip).

TABLE 2. Adult rove-beetles (Staphylinidae) and ground beetles (Carabidae) in D-vac suction samples from a winter wheat field after wheat emergence, at Lackaleigh, near Kanturk, County Cork, Ireland, on 2 November 1985. In total 116m^2 were sampled, resulting in densities of 0.35m^{-2} for *Atheta amplicollis*, and 0.11m^{-2} for *A. fungi*.

Species	*Total no.*
STAPHYLINIDAE	
Aloconota gregaria (Erichson)	1
Amischa analis (Gravenhorst)	3
Atheta [*Mocyta*] *amplicollis* (Muls. & Rey) ♀♀	24
Atheta [*Mocyta*] *amplicollis* (Muls. & Rey) ♂♂	16
Atheta [*Mocyta*] *fungi* (Gravenhorst) ♀♀	13
Atheta triangulum (Kraatz)	1
Lesteva longoelytrata (Goeze)	9
Oxypoda brevicornis (Stephens)	1
Stenus fulvicornis Stephens	1
Stenus nanus Stephens	2
Stenus ossium Stephens	3
Stenus picipes Stephens	1
Sunius propinquus (Brisout de Barneville)	1
Tachyporus hypnorum (Fabricius)	4
Xantholinus linearis (Olivier)	1
CARABIDAE	
Bembidion lampros (Herbst)	1
Bembidion obtusum Audinet-Serville	7
Notiophilus biguttatus (Fabricius)	1
Trechus quadristriatus (Schrank)	1

TABLE 3. Adult rove-beetles (Staphylinidae) in pitfall trap (field) and sieve (fence-wall) samples from an old sheep-grazed pasture near Riverstick, County Cork, Ireland, in January 1985.

Species	*Field centre*	*Field margin*	*Fence-wall moss*
Acidota cruentata Mannerheim	1	2	-
Aleochara lanuginosa Gravenhorst	-	-	1
Amischa analis (Gravenhorst)	-	-	15
Amischa decipiens (Sharp)	-	-	13
Amischa nigrofusca (Stephens)	1	-	14
Atheta [*Mocyta*] *amplicollis* (Muls. & Rey)	-	-	3
Atheta [*Mocyta*] *fungi* (Gravenhorst)	-	-	9
Atheta [*Mocyta*] sp.	-	-	1
Atheta [*Dimetrota*] *nigripes* (Thomson)	-	-	2
Atheta [*Datomicra*] *sordidula* (Erichson)	-	-	1
Gabrius breviventer (Sperk)	-	-	1
Ocypus aeneocephalus (DeGeer)	4	-	-
Quedius curtipennis Bernhauer / *fuliginosus* (Gravenhorst) ♀	1	-	-
Tachinus rufipes (Linnaeus)	-	-	2
Tachyporus chrysomelinus (Linnaeus)	-	-	31
Tachyporus dispar (Paykull)	-	-	1
Tachyporus hypnorum (Fabricius)	2	1	21
Tachyporus nitidulus (Fabricius)	1	-	-
Tachyporus obtusus (Linnaeus)	-	-	6
Tachyporus pusillus Gravehnorst	1	-	-
Tinotus morion (Gravenhorst)	-	-	3
Total	11	3	124

TABLE 4. Published records of staphylinid beetles in cultivated fields during winter. W = winter.

Time period	*Crop*	*Taxa*	*Density m^{-2} or no. in traps*	*Region + reference*
Mid-Nov. to mid-March	W. wheat	5 species 2 unid. aleocharine spp.	0.62 - 6.00 m^{-2} ≈ as above*	Switzerland (F & R (04))
Mid-Nov.	W. rye	*Atheta fungi*	20 trapped	Schleswig-Holstein (T & T (80))
Mid-Nov.	Maize	*Atheta fungi*	0 trapped	
December	Wheat	All staph. species	c. 40 trapped	Czech Republic (B & P (85))
Winter	W. rape	*Lesteva longoelytrata* 'Athetae' *Omalium caesum* *Omalium rivulare* *Tachinus fimetarius*	most abundant common common common common	Schleswig-Holstein (Hoss (63))
Dec. - Jan.	W. wheat	Staphylinidae	7 in soil cores	Switzerland (P & L (00))
Dec. -Jan.	W. cereals	*Tachyporus chrysomelinus* *Tachyporus hypnorum*	0.66-1.39 m^{-2}‡ 1.91 m^{-2}‡	SE England (Soth (84))
Winter	W. wheat (crop edge)	Aleocharinae *Stenus clavicornis*	19-47 in cores 5-10 in cores	Belgium (D & D (84))
November	W. wheat	Staphylinidae	c.30 trapped	Ireland (K & C (85))

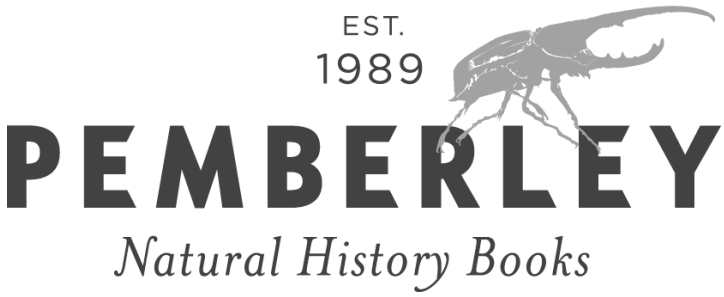
References in the table

B & P (85) - Boháč & Pospišíl (1985); D & D (84) - D'Hulster & Desender (1984); F & R (04) - Frank & Reichhart (2004); Hoss (63) - Hossfeld (1963); K & C (85) - Kelly & Curry (1985); Obr (68) - Obrtel (1968); P & L (00) - Piffner & Luka (2000); Soth (84) - Sotherton (1984); T & T (80) - Topp & Trittelwitz (1980).

(* 'abundant 'interpreted as meaning abundant relative to the density recorded above for the 5 most abundant species).

(‡ Recalculated from transformed data).

NOTICES



Pemberley Natural History Books was established in 1989. In 2000, we also opened a shop in Richings Park, Iver which is conveniently located close to London and Heathrow airport.

Visitors have the opportunity to browse our extensive stock of books on entomology and related natural history subjects. In addition to new, used and antiquarian books we also stock journals, scientific papers and artwork. Our stock is also available via our website.

We are always interested in purchasing books and libraries in our specialist fields, particularly antiquarian and scholarly works.

Pemberley Books publishes two journals*: Entomologist's Gazette* and *Entomologist's Monthly Magazine*. Print and online subscriptions available.

Shop opening hours
Monday - Friday: 10:00 - 17:00.
Saturday: 11:00 - 16:00.
If you are travelling far, please telephone to confirm opening times.

Contact Details
Ian Johnson
Pemberley Books
18 Bathurst Walk,
Iver, Buckinghamshire,
SL0 9AZ
U.K.

Telephone: +44 (0)1753 631114
Email: ian.johnson@pemberleybooks.com

Website: www.pemberleybooks.com

♣ ♣ ♣ ♣ ♣ ♣

THE IRISH BIOGEOGRAPHICAL SOCIETY

PUBLICATIONS AVAILABLE FROM THE SOCIETY

Visit our website: <www.irishbiogeographicalsociety.com> for details concerning prices and cost of postage.

♣ ♣ ♣ ♣ ♣ ♣

PAYMENTS

Publication orders may be e-mailed to the Treasurer Mr John Walsh at <ampersandwalsh@gmail.com> or the Editor at <joconnor@museum.ie>. Orders by post and subscriptions should be sent to Dr J. P. O'Connor, Emeritus Entomologist, National Museum of Ireland – Natural History, Merrion Street, Dublin D02 F627, Ireland, with cheques made payable to "The Irish Biogeographical Society".

Payments may also be made electronically. Details upon request.

♣ ♣ ♣ ♣ ♣ ♣

BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY (A5 FORMAT)

The Bulletin is sent free to all members. The annual membership subscription is €15 or £10. To-date, 43 volumes have been published. Back issues may be purchased for €15 or £10 each.

♣ ♣ ♣ ♣ ♣ ♣

OCCASIONAL PUBLICATIONS OF THE IRISH BIOGEOGRAPHICAL SOCIETY (A5 FORMAT)

Number 1. *Proceedings of The Postglacial Colonization Conference*
Number 2. *Biogeography of Ireland: past, present and future*
Number 3. *A checklist of Irish aquatic insects*
Number 4. *A catalogue of the Irish Braconidae (Hymenoptera: Ichneumonoidea)*
Number 5. *The distribution of the Ephemeroptera in Ireland*
Number 6. *A catalogue of the Irish Chalcidoidea (Hymenoptera)*
Number 7. *A catalogue of the Irish Platygastroidea and Proctotrupoidea (Hymenoptera)*
Number 8. *A catalogue and index of the publications of the Irish Biogeographical Society* (1977-2004)
Number 9. *Fauna and flora of Atlantic islands. Proceedings of the 5th international symposium on the fauna and flora of the Atlantic islands, Dublin 24 -27 August 2004.*
Number 10. *A catalogue of the Irish Ichneumonidae (Hymenoptera: Ichneumonoidea)*
Number 11. *A catalogue and atlas of the caddisflies (Trichoptera) of Ireland*
Number 12. *Chironomidae (Diptera) of Ireland – a review, checklist and their distribution in Europe*

♣ ♣ ♣ ♣ ♣ ♣

MACRO SERIES OF THE IRISH BIOGEOGRAPHICAL SOCIETY (A4 FORMAT)

1. *First Supplement to A Bibliography of Irish Entomology*
2. *An annotated checklist of the Irish butterflies and moths (Lepidoptera)*
3. *An annotated checklist of the Irish two-winged flies (Diptera)*
4. *An annotated checklist of the Irish Hymenoptera*
5. *A world catalogue of Chironomidae (Diptera). Part 1. Buchonomyiinae, Chilenomyiinae, Podonominae, Aphroteniinae, Tanypodinae, Usambaromyiinae, Diamesinae, Prodiamesinae and Telmatogetoninae*
Orders for this volume may be also sent by e-mail to Dr Patrick Ashe: <patrick.ashe1983@gmail.com>
6. *Second Supplement to A Bibliography of Irish Entomology*
7. *An annotated checklist of the Irish Hemiptera and small orders*
8. *A World Catalogue of Chironomidae (Diptera) Part 2. Orthocladiinae*
Orders for this volume may be also sent by e-mail to Dr Patrick Ashe: <patrick.ashe1983@gmail.com>

♣ ♣ ♣ ♣ ♣ ♣

ISSN 0032-1185

Grehan Printers, Dublin 2, Ireland